

חוות דעת של מומחה

בהתאם לסעיף 24 לפקודת הראיות [נוסח חדש] התשל"א-1971

שם המומחה:

נחום שחף, MSc.
ת"ז 00134403.

מענו ומקום עבודתו:

נשיא חברת "NATOP - Navigation Targeting and Electro Optical Systems", מרחוב הבילויים 3 רמת גן.

אני החתום מטה נתבקשתי על ידי רוני ברכר, מנכ"ל חברת איירק טכנולוגיות ישראל בע"מ (להלן - "איירק"), לחוות דעתי המקצועית בשאלות המפורטות מטה, בהתאם לסעיף 24 לפקודת הראיות [נוסח חדש] התשל"א-1971 והתוספת הראשונה לפקודה:

1. האם רדיד האלומיניום אותו משווקת איירק, המוכר גם כ-ZONE030, מקוז את רמות הקרינה מטלפונים סלולאריים וממכשירי חשמל?

2. האם הרדיד הנ"ל הוא בגדר חידוש או שמא, לפי מיטב ידיעתי כמי שבקיא בתחום הקרינה, ישנם מוצרים דומים בשוק אשר גורמים לאותה תופעה פיסיקאלית ואשר נתמכים בהוכחות מדעיות כגון מוצר זה?

3. האם הרדיד הנ"ל פועל על כל מכשיר טלפון סלולארי ועל כל מכשיר חשמל, או שמא הוא מוגבל לסוג ו/או דגם מסוימים?

אני נותן חוות דעתי זו במקום עדות בבית המשפט ואני מצהיר בזאת כי ידוע לי היטב, שלעניין הוראות החוק הפלילי בדבר עדות שקר בשבועה בבית המשפט, דין חוות דעתי זו כשהיא חתומה על ידי כדין עדות בשבועה שנתתי בבית המשפט.

ואלה פרטי השכלתי:

- 1970-1973 – אוניברסיטת בר אילן, המחלקה לפיסיקה, תואר BSC בהצטיינות.
- 1974-1977 – אוניברסיטת בר אילן, המחלקה לפיסיקה, תואר MSC בהצטיינות.
- 1974-1977 – מתרגל במחלקה לפיסיקה, אוניברסיטת בר אילן; מרצה בקורסים לילדים מחוננים באוניברסיטת בר אילן; מפתח תוכנית הוראה למחוננים "פיסיקה ומעשי קסם"; הרצאות על השיטה בכנס ארצי ומפגשים עם מרכזי הוראה למחוננים בארה"ב.
- 1981-1988 – השתלמויות בנושאים הבאים: Image Processing (תדיראן); מערכות בקרה (תדיראן); מערכות מומחה (AI) באוניברסיטת תל אביב;
- 1997 – תואר עמית משרד המדע.

ואלה פרטי ניסיוני:

- 1968-1970 – חברת IBM ישראל. מתכנת ומנתח מערכות.
- 1978-1979 – חברת אלסינט. פיסיקאי חבר בצוות הפיתוח של הטומוגרף הממוחשב (CT). ראש פרויקט שילוב ה-CT ב-RTP (תכנון מסלולי קרינה לריפוי סרטן).

- 1980 – טייס ניסוי והדגמה על גלשני אוויר במדינת קליפורניה; מוסמך על ידי USHGA (United States Hand Gliding Association) ומוסמך מטעמה להסמכת כוחנים על גלשני אוויר בישראל.
- 1981-1988 – חברת תדיראן מערכות. פסיקאי חקר ביצועים והנדסת מערכת, תחומים: שיפור מערכות ירי לטנקים; פיתוח וגיווש הקונספטים למזל"טים ולמערכות תצפית אוויריות; פיתוח שיטות לכיול, איכון וניווט ממזל"טים ולמערכות אוויריות.
- 1989-1991 – תעשייה אווירית תמ"מ. פסיקאי, תחומים: חקר ביצועים; פיתוח קונספטים למזל"טים, לירי טילים ממסוקי תקיפה; עקיבה אחרי טילים בליסטיים; פיתוח שיטות כיול, איכון וניווט.
- 1993-נוכחי – נשיא חברת NATOP.

ואלה פרטי ניסיוני המיוחד:

- פרס משרד המדע, 1997; בעל תואר עמית משרד המדע.
- עומד בראש קבוצת מדענים הבודקת את ההתאמה של מעבדות הקרינה בנחל-שורק לבדיקת אנטנות סלולאריות, ובהם: ד"ר מאיר דנינו, מדען ראשי בחברת אלישרא; זאב וישנייה, ממונה בטיחות הקרינה בחברת אלישרא; ד"ר שמואל ברנר, לשעבר הממונה על הקרינה במדינת ישראל מטעם המשרד לאיכות הסביבה.
- הרצאה בנושא מיגון אזרחי מפני טילים בליסטיים לא קונבנציונאליים – מחלקה לפיסיקה, אוניברסיטת בר אילן, 1991.
- הרצאה בנושא השפעת הבום העל-קולי בהגנה נגד טילים בליסטיים לא קונבנציונאליים – טכניון חיפה, 1997.
- הרצאה בנושא מזל"טים ליחידת המזל"טים של צה"ל, 1999.
- הרצאה בכינוס השנתי של האקדמיה האמריקאית לרפואה משפטית ולקרימינליסטיקה (AAFS), 2005.
- הרצאה במכון היצוא והצגת מחקרים במשרד החוץ בנושאים שונים, 1995, 1996, 2001, 2004.
- חבר בצוות התעשיות הביטחוניות לגיבוש קונספט ההגנה נגד טילים בליסטיים, 1990-1991.
- ראש צוות מדענים בחברת תדיראן לגיבוש האסטרטגיה של החברה בתחום המודיעין החזותי, 1984-1985.
- שותף להכנת הצעה למזל"ט הצה"לי, הצעה זוכה, 1982.
- ספרים ומסמכים:
 - טיווח ארטילרי על ידי מזל"ט – כיול, איכון וטיווח ארטילרי באמצעות מזל"ט.
 - מערכת שליטה רב-מזל"טית – יכולת אוטונומית למזל"טים.
 - חוזי סופר-טקטי – מערכות חזותיות לרמות הטקטיות, מערכות אוויריות וקרקעיות.
- המצאת השיטה לייצוב קו ראייה אלקטרוני, 1985.
- פיתוח שיטת המיקרו-מזל"ט, 1984-1985.
- פיתוח שיטת ניווט קו ראייה, 1985-1988.
- בעל מספר פטנטים, וביניהם:
 - פטנט לגילוי ועקיבה טילים בליסטיים, תעשייה אווירית, 1990.
 - פטנט לראיה דרך קירות, חברת NATOP, 2001 (הוצג בערוץ המדע הישראלי 2004).
 - פטנט pending להגנה מפני ירי והדף מפיצוץ, חברת NATOP, 2005.

תיאור הבדיקה שבוצעה והאסמכתאות שהובאו לעיוני:

הבדיקה כללה שלוש פאזות. הבדיקות בוצעו בהתאם לשיטת המדידה המרחבית של מכון IIREC ובאמצעות מד מיקרו-טסלה (μTesla), לבדיקת צפיפות השדה המגנטי. בפאזה הראשונה, נבדקה עוצמת הקרינה המגנטית במטריצה של נקודות מרחביות. בפאזה השנייה, הבדיקה חזרה על עצמה בהפעלת המכשיר הסלולארי ובפעם השלישית – לאחר שהוסף למכשיר רדיד ZONE030. התוצאות נותחו בצורה ממוחשבות במכון IIREC באוסטריה ותוצאותיהן נשלחו אלי.

הבדיקה בוקרה במספר אמצעים:

- א. נעשתה דגימה על-ידי הח"מ לגבי מספרי הקריאה שהוזנו למחשב.
- ב. נעשתה דגימה של מספרי הקריאה שהועברו לאוסטריה.
- ג. נעשה ניתוח תיאורטי של האפקט.
- ד. נבדקו התוצאות.

וזאת חוות דעתי (בהתאמה לשאלות לעיל):

1. מבחינת התוצאות הממוחשבות שהובאו לעיוני עולה שגרדיינט (gradient) השדה המגנטי, גורם חשוב ביצירת נזקים בגוף האדם, קטן לאחר הוספת הרדיד הנזכר. למרות שהעוצמה המרבית שנפלטת מהמכשיר נשארה זהה, הגרדיינטים קטנו. ובכך קוזז חלקית הגרדיינט והשדה המגנטי התאזן חלקית. אפקט נוסף הוא הנגזרת המרחבית השנייה שקטנה על-פי התוצאות שהתקבלו מאוסטריה באופן ניכר. לטענת מפתח השיטה, ד"ר וולטר מדינגר, להקטנת הנגזרת המרחבית השנייה יש משמעות דומיננטית בכל הקשור לנזקים בגוף האדם. על פי תוצאות אלה ישנן תוצאות משמעותיות בנגזרת המרחבית השנייה שעשויה לקזז נזקים בריאותיים.

2. על פי מיטב ידיעתי ומתוך שיחה בה נועצתי עם חברי ד"ר זמיר שליט"א, מומחה בתחום האפקטים הבריאותיים, עולה שאין אנו מכירים התקנים היוצרים אפקטים פיסיקאליים דומים לאלו של הרדיד של איירק, למרות שקיימים התקנים שממסכים את הקרינה – אך כאמור, לא כאלה בעלי השפעה פיסיקאלית הדומה לנדון. הנושא לא נבדק עד תומו.

3. בעקרון המערכת צריכה לעבוד על התקנים סלולאריים ניידים, אם כי רמת ההשפעה שלו תהיה שונה לגבי התקנים בעלי אנטנה קווית והתקנים בהם האנטנה פועלת באמצעות הגוף כולו. אין בידי הערכה כמותית מדויקת לגבי הבדלי ההשפעה על שני סוגי האנטנות.

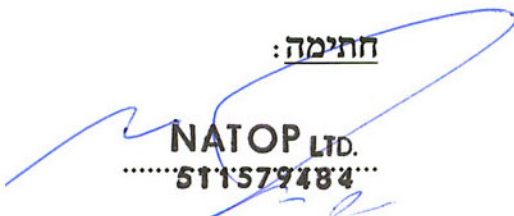
מסקנה:

על פי התוצאות שנותחו באוסטריה ונבדקו על ידי, עולה כי רדיד ZONE030 של חברת איירק טכנולוגיות ישראל בע"מ מקטין את הנגזרת המרחבית הראשונה של השדה המגנטי. לכך, על פי משוואות MAXWELL, צריכה להיות השפעה מקוזזת על השדות החשמליים ועל הזרמים בגוף האדם. בכך, הרדיד מאזן חלקית את השדה המגנטי. לכך אמורה להיות השפעה של הקטנת הנזקים הבריאותיים משימוש במכשירים סלולאריים וחשמליים.

תאריך:

יום שני, 12.12.2005.

חתימה:


NATOP LTD.
.....511579484.....

Translation Expert Opinion – Nachum Shachaf

According to section 24 of the Evidence Ordinance (New Version), 5731-1971

Expert Name:

Nachum Shachaf, MSc

I.D. 00134403

Address and work place:

President of NATOP (Navigation Targeting and Electro Optical Systems) Ltd., 3
Habiluim Street Ramat Gan.

I, the undersigned, was asked by Ronny Brecher, CEO of IIREC Technologies Israel Ltd. (henceforth "IIREC") for my professional opinion concerning the questions detailed below, in accordance with section 24 of the Evidence Ordinance (New Version), 5731-1971 and the first addition to the ordinance:

1. Does the aluminum foil marketed by IIREC, also known as ZONE030, equalize the levels of radiation emitted from cellular phones and electric appliances?
2. Does the foil mentioned above constitute an innovation, or, based on the best of my knowledge and my proficiency in the radiation field, similar products in the market cause the same physical phenomenon and are scientifically proven, just like this product?
3. Does the foil mentioned above affect all cellular phones and appliances, or is its effect limited to a certain type and/or model?

I give this opinion instead of a testimony in the court of law, and I hereby declare that I am fully aware of the criminal law regarding perjury in the court of law, and that the status of my expert opinion with my signature affixed, is considered as testimony given under oath in a court of law.

The details of my education are as follows:

- 1970-1973: Bar Ilan University, Department of Physics, BSc magna cum laude.
- 1970-1973: Bar Ilan University, Department of Physics, MSc magna cum laude.
- 1974-1977 – teacher's assistant In the Department of Physics, Bar Ilan University; lectured in courses for gifted children at Bar Ilan University; developed teaching program for gifted children, "Physics and Magic"; lectured about this method in a national convention and in meetings with centers of teaching for gifted children in the United States.
- 1981-1988 – advanced studies of the following topics: Image Processing (Tadiran); Control systems (Tadiran); AI systems (Tel-Aviv university)
- 1997 –Ministry of Science and Technology Fellow

The details of my professional experience are as follows:

- 1968-1970: IBM Israel – programmer and system analyst
- 1978 – 1979 – ELSCINT company. Physician, member of the team that developed the computerized tomography (CT). Headed the project that integrated the CT in the RTP. (Rapid Tissue Processing, planning radiation tracks for curing cancer)
- 1980 – Test and demonstration pilot of hang gliders in the state of California; authorized by USHGA (United States Hang Gliding Association) and authorized by this association to authorize testers on hang gliders in Israel.
- 1981-1988 – Tadiran Systems company. Performance research and system engineering physician. Handled: improving shooting systems for tanks; developing and forming the concepts for MRVPs and for airborne observation systems; developed methods for calibrating, spotting and navigating from MRVPs and to airborne systems.
- 1989-1991 – IAI (Israel Aircraft Industries) TAMAM division. Physician. Handled performance research; developed concepts for MRVPs, for shooting missiles from assault helicopters, and for tracking ballistic missiles; developed methods of calibration, spotting and navigation.
- 1993 – now: President, NATOP company

The details of my special experience are as follows:

- Ministry of science and technology award, 1997: Ministry of Science and Technology Fellow
- Heads a team of scientists that checks whether the radiation labs at Nahal Sorek are fit for testing cellular antennas. This team includes, among others: Dr. Meir Danino, chief scientist of Elisra company; Zeev Vishniya, person in charge of radiation safety in Elisra; Dr. Shmuel Brenner, formerly supervisor of the radiation field in the state of Israel on behalf of the Ministry of Environment
- Lectured about civil protection from unconventional ballistic missiles – Department of Physics, Bar-Ilan University
- Lectured about the effect of the supersonic explosion on the protection against unconventional ballistic missiles – Tecnion, Haifa, 1997
- Lectured about MRVPs to the IDF MRVP unit, 1999
- Lectured in the annual convention of the American Academy of Forensic Sciences (AAFS), 2005
- Lectured in the Israel Export and International Cooperation Institute and presented researches on various issues in the Ministry of Foreign Affairs, 1995, 1996, 2001, 2004
- Was a member of the security industry team that forms the concept of protecting against ballistic missiles, 1990-1991
- Headed a team of scientists in Tadiran company that formed the company's strategy in the field of visual intelligence, 1984-1985
- Took part in preparing a proposal to the IDF MRVP (the proposal that won the tender), 1982
- Wrote the following books and documents:
 - Artillery ranging by MRVP – calibrating, spotting and artillery ranging by an MRVP
 - Multi-MRVP control system – autonomous capability for MRVPs
 - Super tactical visual – visual systems for the tactical levels, airborne and ground systems

- Invented the method of stabilizing an electronic line of sight, 1985
- Developed the micro-MRVP method, 1984-1985
- Developed the line of sight navigation method, 1985-1988
- Owns several patents, including:
 - Patent for detecting and tracking ballistic missiles, the Israeli Aircraft Industry, 1990
 - Patent for seeing through walls, NATOP company, 2001 (presented in the Israeli Science Channel)
 - Patent-pending invention for protecting against shooting and explosion-generated blast, NATOP company, 2005

Description of the Tests I Made and the Proofs Brought to My Reference:

The check included three phases. The tests were conducted according to the IIREC field coherence pattern measurement method and by using a micro-tesla meter (μ tesla), to check the magnetic field's density. In the first phase, the power of the magnetic radiation was tested in a matrix of field coherence pattern points. In the second phase, we repeated the test while operating a cellular phone, and in the third phase we did the test after adding the ZONE030 foil to the phone. The results were analyzed by computer in IIREC institute in Austria and the computerized analysis results were sent to me.

The test was controlled by several means:

1. The undersigned sampled several reading numbers that were entered into the computer
2. The reading numbers that were transferred to Austria were sampled.
3. The effect was theoretically analyzed.
4. The results were tested.

This is my opinion (respective to the questions raised above):

1. The computerized results brought to my reference prove that the magnetic field gradient, a significant cause for damages in the human body, reduces after adding the foil mentioned above. Even though the maximal power of the radiation emitted from the appliance remained identical, the gradients reduced. Thus, the gradient was partially equalized and the magnetic field was partially equalized. Another effect is the second field coherence pattern derivative, which, according to the results obtained from Austria was significantly reduced. The method developer, Dr .Walter Medinger, claims that reducing the second field coherence pattern derivative significantly affects the damages caused to the human body. According to these results, adding the foil yielded significant results in the second field coherence pattern derivative, results that can offset health damages.
2. Based on the best of my knowledge, and following a discussion in which I consulted my friend Dr. Zamir, an expert in the field of health effects, we are not familiar with any other device that creates physical effects similar to those of IIREC's foil. Several existing devices do screen the radiation, but, as mentioned earlier, no device has a physical effect similar to the device mentioned above. This topic was not thoroughly checked.
3. In principal, the system should be effective with mobile cellular devices, although its effect level will be different when handling devices with linear antenna and devices where the antenna affects the entire human body. I have no accurate

quantitative estimation regarding the differences between the effects over the two antennas.

Conclusion

According to the results analyzed in Austria and tested by me, the ZONE030 foil, made by IIREC Technologies Israel Ltd., reduces the first field coherence pattern derivative of the magnetic field. According to Maxwell's equation, this should have an equalizing effect on the electrical fields and currents in the human body. By so doing, the foil partially equalizes the magnetic field. This should have the effect of reducing the health damages caused by using appliances and cellular phones.

Date

Monday, 12.12.2005

Signature:
NATOP Ltd.
511579484



IIREC

International Institute for Research on
Electromagnetic Compatibility



SK-IM-1400T

Cell Phone Measurement Report No. 011/2005



Operator:

Boaz Grau

Date:

2005-12-11

Time:

8:00 pm

Mobile:

sk-IM-1400T

Meter:

IIREC Precision Teslameter 05/40

This document reports on a measurement of non-thermal effect of a cellular phone in the extremely low frequency (ELF) range of the magnetic field up to ca. 15 Hz.

1. SOME PHYSICAL BASICS

1.1 The natural background:

The earth's natural magnetic field (geomagnetic field, GMF) is basically a static field, with superimposed very slow oscillations. Due to technical (and sometimes geological) influences, distortions in the spatial magnetic field arise and result in the formation of disturbance points or zones. The intensity of the magnetic field is quantified as the magnetic flux density or magnetic induction. Its unit in the International Metric System (SI) is 1 Tesla (T). The intensity of the GMF lies in the order of magnitude of Microtesla (μT), i.e. 1/1,000,000 Tesla. Meters for this quantity are mostly denoted as Teslameters. Another usual unit is the Gauss. 1 Gauss = 100 μT .

1.2 Cellular phone radiation and its effects

It is a matter of fact that electromagnetic waves such as microwave (MW) radiation of cellular phones can heat the human body tissue. The higher the radiation density (measured e.g. in mW/m^2), the more the tissue is heated. This result is called thermal effect. It is usually quantified as SAR value (specific absorption rate). The current limit for mobiles amounts to 2 Watt per kg of body tissue. Now, complaints may occur even if a body heating cannot be measured any more. Effects that are independent of body heating are called non-thermal effects. These are caused by signals of extremely low frequencies (ELF) at very low power levels. Biological systems are very sensitive to signals of this kind.

2. THE MEASURING METHOD

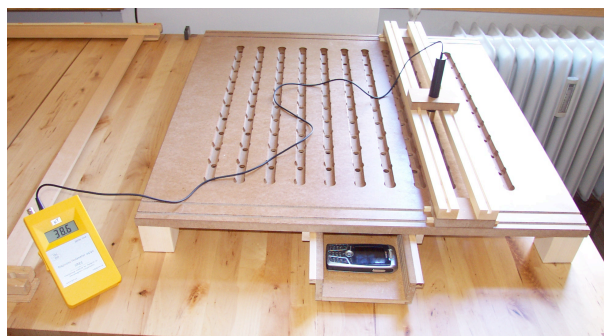
Magnetic causes of non-thermal effects can be measured by the IIREC Field Coherence Pattern (FCP) method. The measured results are subjected to mathematical analysis and visual mapping. The IIREC FCP measurement is based on the flux density of the ELF magnetic field from 0 to ca. 15 Hz. The measured quantity is the vertical component of the magnetic flux density. As a special feature of the FCP method is its survey of the spatial distribution of the measured quantity.

A single measured value of magnetic induction is not sufficient to characterize the biological impact. A mapping of the spatial distribution of measured values in a Field Coherence Pattern (FCP) indicates marked differences between measured values on neighboring points, strong gradients between measuring points etc. The more unequal the course of measured values, the more irritating (or stimulating) the magnetic field will be. Based on the FCP measuring method, the IIREC Field Gradient Divergence (FGD) is a mathematical analysis that for each measuring point yields a quantification of disturbance.

3. CONDUCTING THE MEASUREMENT

3.1 Measurement setup:

On a wooden table without metal parts, a measurement grid in the dimension of 50 cm by 50 cm is spread out. Distances between measuring points are 5 cm. Altogether, 121 points are measured in order to represent the whole area. A wooden rack facilitates a measurement ca. 5 cm above the cellular.



- Step 1: First of all, the field is measured without a cellular to map the initial status.
- Step 2: Then a cell phone is positioned in the center of the field and activated by dialling from a distant phone.
- Step 3: To be sure that there is a constant signal, a period of about 10 minutes is waited. (During dialling, the signal is somewhat stronger, after that it remains nearly constant.)
- Step 4: With the transmitting cellular in the center, the measurement of the field is repeated.
- Step 5: In order to demonstrate the effectiveness of an equalizing device (e.g. a foil) on the magnetic field, this device is attached to the cellular, and the cellular is activated again (cf. step 2). A period of half an hour is waited, because during this period the foil interacts with the magnetic field. Then, the measurement is conducted once more, and the results are evaluated.

4. EVALUATION OF MEASUREMENT

The results are mapped in the following ways:

4.1 FCP (Field Coherence Pattern) representation

By use of a data analysis software the course of magnetic flux density in Microtesla between measuring points is interpolated. Finally, a map is generated which - like a geographic map - shows “highs” and “lows” of the magnetic field, and lines of equal vertical flux density. Disturbances in the field yield a coherent pattern, so the method is called Field Coherence Pattern (FCP).

4.2 3D mapping

The representation in 3 dimensions gives no separate representation, it merely visualizes the spatial distribution of the magnetic field as mapped in the FCP. This is a very good basis for the evaluation of the overall condition of the field, but no conclusions can be drawn to single points of disturbance.

4.3 Difference mapping

This kind of map is most important for cellular phone measurements.

4.3.1 Cell phone minus background

This map represents the effect of the cellular without magnetic field equalization device. It shows the change generated by a transmitting cell phone in the magnetic field.

4.3.2 Cell phone with specimen minus cell phone alone

This map shows the effect of the magnetic field equalization device. It represents the difference of measured values around the transmitting cellular (i) with and (ii) without magnetic field equalization.

4.4 Overall equalization index

Finally, an index derived from the average of Field Gradient Divergence all over the measurement field is indicated in a bar diagram, representing situations without and with equalization foil on the measurement cellular.

5. GUIDELINES FOR READING THE MAPS

5.1 General remarks regarding FCP maps

Note in particular the distances of the lines of equal vertical flux density. Many lines in close distance mean strong gradients. The farther the lines lie apart or the fewer lines are mapped, the lower are the gradients in a region.

5.2 Results with a transmitting cell phone

From measurements with a cellular, strong gradients are resulting at the location of maximum power. In this position, absolute measurement values show maximum deviations from the background, too. In the surrounding field, the lines of equal magnetic flux density get uneven and jagged.

5.3 Results with a transmitting cell phone with an equalization foil

Here are some significant effects to be watched after attaching an effective magnetic field equalization device:

- In the FCP map, lines of equal magnetic flux density are more evenly spread over the field.
- The distances between lines are expanded in the vicinity of the cellular, i.e. gradients are growing weaker.
- Positive and negative deviations of measured values from the mean are reduced.
- Some points of disturbance are completely equalized.



- In the 3D map, the field grows smoother and more equalized in total appearance. The cone at the position of the cellular becomes more regular.
- The overall equalization index shows a general reduction of FGD level. Although there may be disturbance from outside, the disturbances caused by the cellular in the field will be reduced to such a considerable extent, that a reduction of the overall index results.

Note that the strong energetic effects at the position of the cellular phone can not be influenced by a magnetic field equalization foil. This is a necessary condition for a working radio link of the cell phone. The strong disturbance zone in the center of the field will not (and is not designed to) vanish.

6. THE RESULTS OF THIS MEASUREMENT ARE MAPPED ON THE FOLLOWING PAGES

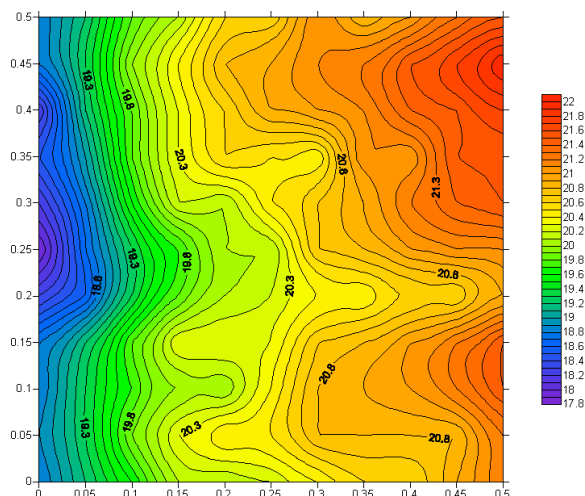
6.1 Field Coherence Pattern (FCP) measurement

6.2 Measurement results as 3D mappings of FCP

6.3 Differential FCP analysis

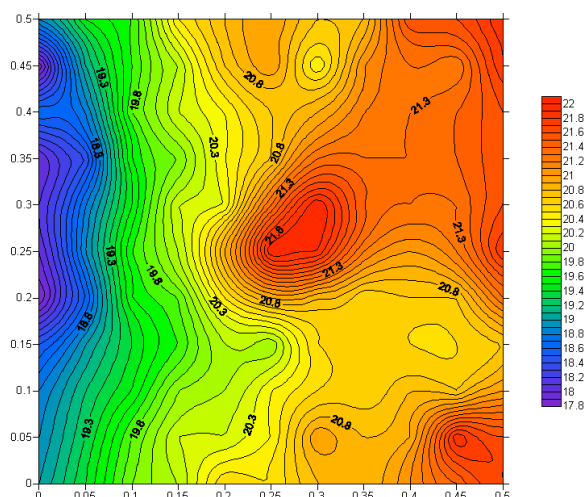
6.4 Overall equalization index

6.1 Field Coherence Pattern (FCP) measurement



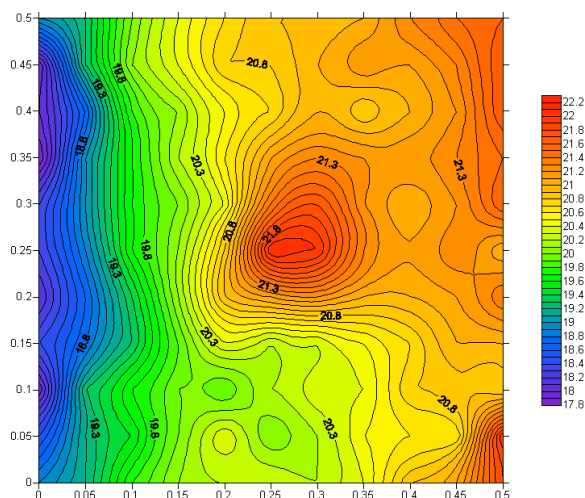
The background represented as FCP (measured values are vertical magnetic flux densities in μT):

The original situation of the test field (0.5 x 0.5 m) shows no marked irregularities, its gradients are not too much equalized, though. Therefore it is well suitable to detect by measurement the equalization effect of a technical foil designed to bring about this effect. If a background magnetic field were too smooth, the measurement would only show the energetic effect.



A transmitting cellular phone of type sk-IM-1400T represented in the FCP:

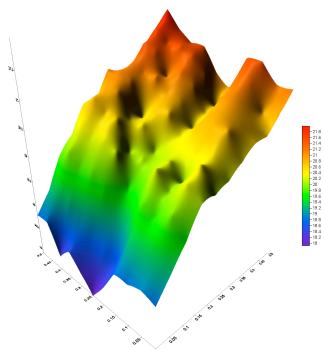
The cellular is situated in the centre of the measurement field. By its transmitted energy, it causes principally a peak in the magnetic induction map. This cone will not vanish by a successful equalization because the equalization foil is not designed to reduce the energy of the cellular. Note the lines of equal magnetic induction around the peak. They are uneven and jagged, thus indicating the disturbance of the field.



The same transmitting cellular phone with an attached equalization foil represented in the FCP:

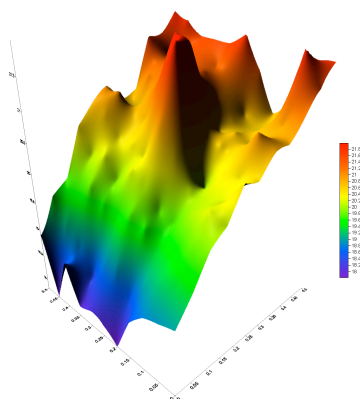
The energetic cone around the cellular persists (energy transmission is of course indispensable for the function of the cellular). However, the lines of equal magnetic induction around the peak have become rounder and more regular. Some of the disturbance zones caused by the cellular have completely vanished. Its surroundings are settled. The field is cleared from stress points and has adopted a better biological compatibility.

6.2 Measurement results as 3D mappings of FCP



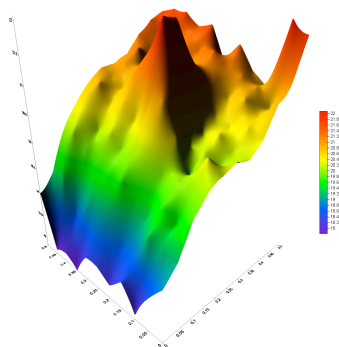
The background in 3D representation of FCP:

The visible situation is obviously calm, the field slightly undulated, showing usual spot variances. At the upper and lower edges, there are disturbing influences.



A transmitting cellular phone of type sk-IM-1400T in the 3D representation of FCP:

In the center there is the transmitting cellular. The cone in this position shows the effect of the transmitted energy in the magnetic field. It cannot be avoided, not even in case of a successful field equalization, because the energy of the cellular is not reduced by the equalization foil. The disturbances along the edges are aggravated.

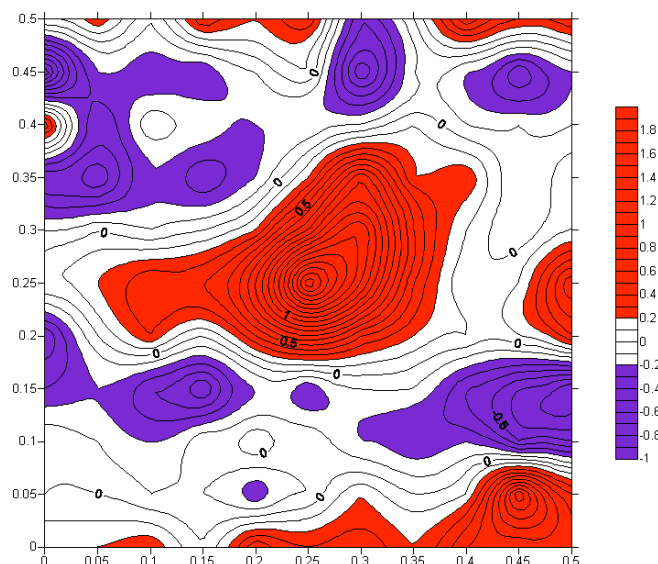


The same transmitting cellular phone with an attached equalization foil in the 3D representation of FCP:

The energetic cone around the cellular persists (energy transmission is of course indispensable for the function of the cellular). The surrounding field has become calm, dents being "ironed out".

6.3 Differential FCP analysis

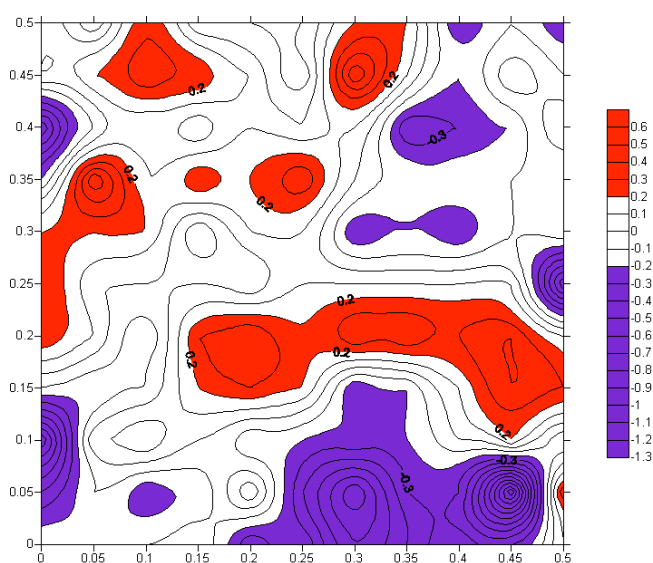
Difference between transmitting cellular phone without foil and background



The effect of the cellular phone:

Underlying this mapping, the measured data of the background situation are subtracted from the data of the transmitting cellular. Thus, the mapping gives a precise indication of the changes caused by the cellular in the magnetic field. It is clearly visible that there are not only the energetic effect of the transmitting device in the centre of the field but also significant changes in the surroundings. This structured disturbance, in a phoning situation, has a spatial effect in our body: an interference with the biological system in the brain, eyes, internal ear, mouth and teeth region.

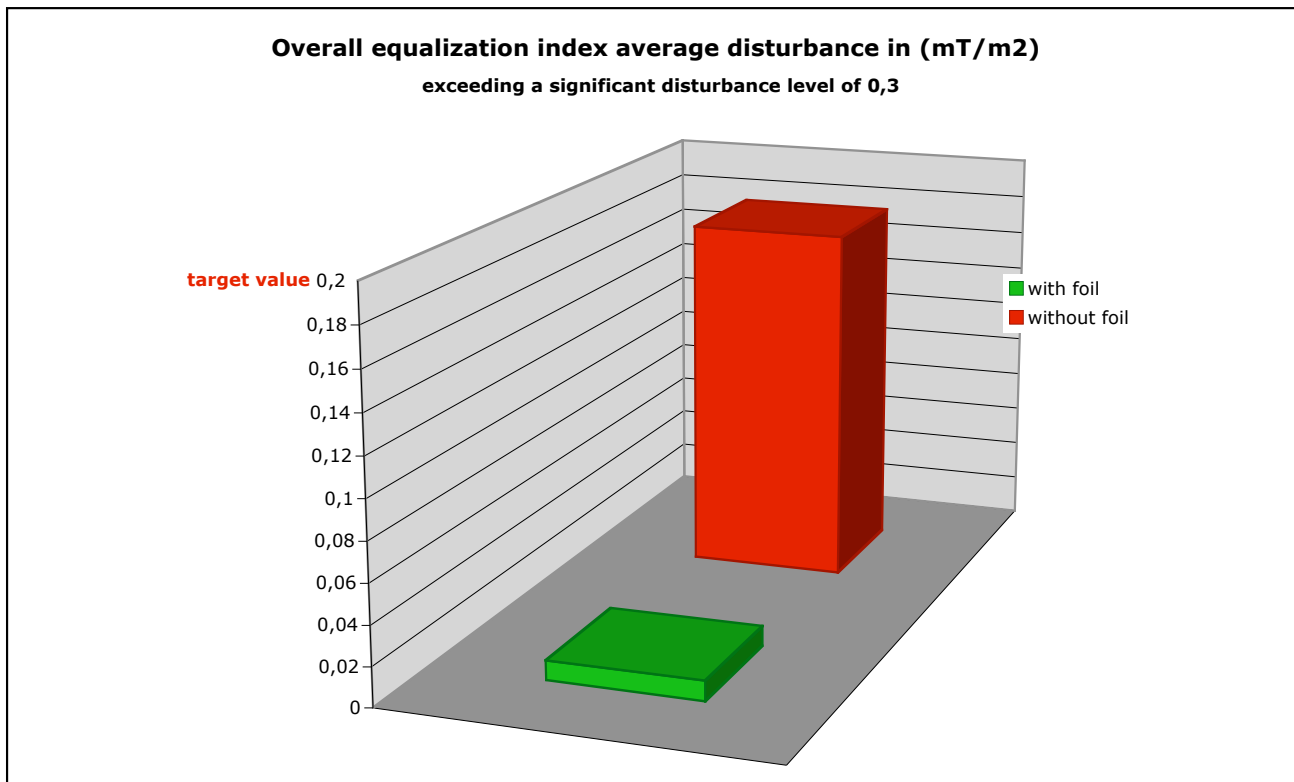
Difference between transmitting cellular phone with equalization foil and transmitting cellular phone without equalization foil



The effect of the equalization foil:

For this mapping, the measured data of the cellular without equalization foil are subtracted from the data of the cellular with the foil. So, the objective effect of the foil is shown. The equalization aims at reversing the additional gradients caused by the cellular phone. To read in this chart, it must be compared with the chart above. Where the magnetic induction was going down (violet or blue color), on the difference chart below there should be a trend in the opposite direction (red or yellow). Roughly spoken: Where above dark blue or violet areas are forming, below red or yellow ones should emerge and vice versa. The better this is fulfilled, the smoother the magnetic field has become. In this case an excellent equalization was achieved (cf. 3D mapping).

6.4 Overall equalization index



The overall equalization index is calculated by subtraction of a significance threshold of 0.3 from the average Field Gradient Divergence (FGD). The FGD is a very sensitive indicator for all kinds of disturbances from inside or outside the measuring field. FGD values were accepted if the original FGD (without foil) was higher than a noise level of 0.2, and filtered for disturbances from outside. The filtering criterion was a difference of 0.7 or more in absolute measured values between subsequent measurements. By selection of a significance level of 0.3 for FGD, a signal-to-noise-ratio of 1.5 was set. In this case, a distinct reduction of disturbance was achieved with the equalization foil. By application of the foil, the index was reduced to a value below the target value of 0.2.

END OF REPORT.