Rapport

A single QEEG-scanning during electromagnetic stimulation of 7 Hz and a single QEEG-scanning during electromagnetic stimulation of 10 Hz, both with the eyes closed, show increases of theta- and alpha-activity, compared with a baseline QEEG-scanning with eyes closed.

In the QEEG-scanning during electromagnetic stimulation of 7 Hz compared with the baseline QEEG, the independent t-test shows a statistic significant change in 7-9 Hz. The change related to an increase of brain activity can be seen on O1, O2, P3, P4, Cz, and C4. 7 Hz has increased at Cz, O1 and P3, 8 Hz at P4 and 9 Hz at P3, P4, Cz and C4.

The dynamic FFT Absolute Power Spectrum, shows that 7 Hz theta has increased from 13,90 till 18,48 uA on O1, from 11,38 till 12,99 uA at O2, from 9.19 till 11,86 uA at P3, from 8,18 till 12,60 uA at P4, from 3,59 till 5,56 uA at C4 and from 6,96 till 13,46 uA at Cz.

7.5 Hz theta has increased from 11,14 till 20,87 UA at O1, from 7,64 till 14,73 UA at O2, from 13,05 till 21,01 UA at P3, from 9,85 till 14,59 UA at P4, from 5,04 till 13,96 uA at Cz, from 6,62 till 8,93 uA at C3, and from 4,15 till 7,77 uA at C4.

8 Hz alpha has also increased from 12,38 till 36,50 UA at P3, 15,21 till 22,23 UA at O1, 12,76 till 21,01 UA at O2, from 12,52 till 29,83 UA at P4, from 5,04 till 11,40 uA at Cz, from 4.15 till 11,46 uA at C4 and in a lesser degree from 6,62 till 7,50 at C3.

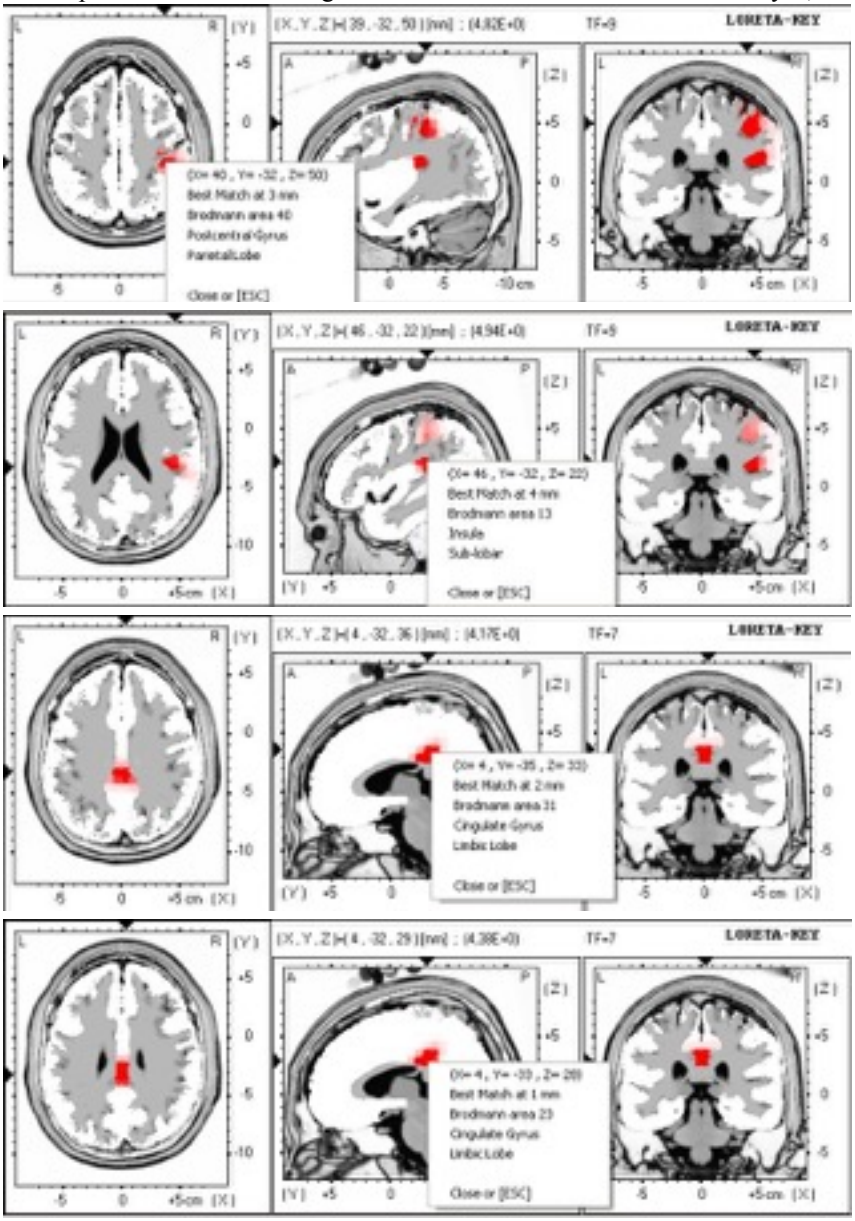
8,5 Hz alpha has increased from 4,49 till 7,95 at C4, from 20,15 till 24,88 uA at P3, from 13,82 till 25,02 uA at P4, from 21,30 till 32,43 uA at O1 and from 19,33 uA till 27,16 uA at O2.

9 Hz alpha has increased from 5,94 till 7,11 uA at C3, from 5,04 till 11,02 uA at C4, from 7,33 till 13,46 uA at Cz, from 53,62 till 60,04 uA at O1, from 23,59 till 39,40 uA at O2, from 18,50 till 38,67 uA at P3 and from 18,55 till 40,77 uA at P4.

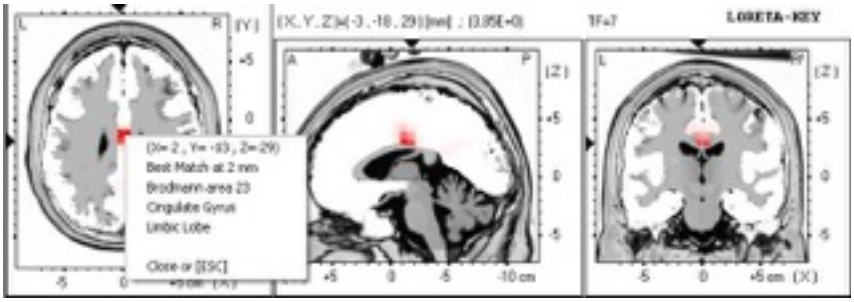
The dynamic FFT Absolute Power Spectrum also shows that 7 Hz theta in particular, but also 8 Hz alpha, in the right side of the frontal lobe (F4) have increased.

At the right frontal lobe (F4), the theta at 7 Hz has increased from 15.65 till 36.11 UA, the theta activity at 7.5 Hz has increased from 13,17 till 37,43 UA and the alpha at 8 Hz has increased from 12,01 till 35,96 UA. But the absolute power paired t-Test and FFT-absolute power difference shows no statistic significant change in this electrodeplacement.

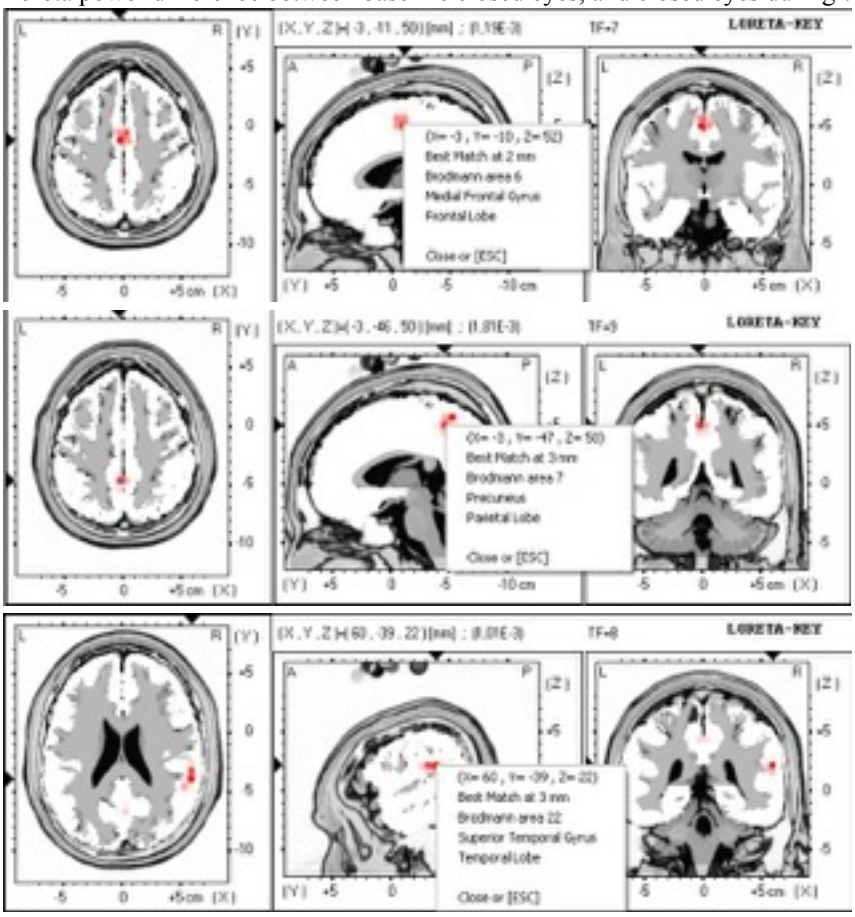
Loreta paired t-Test illustrating the difference between baseline closed eyes, and closed eyes during 7 Hz stimulation



Loreta independent t-Test illustrating the difference between baseline closed eyes, and closed eyes during 7 Hz stimulation



Loreta power difference between baseline closed eyes, and closed eyes during 7 Hz stimulation



The greatest statistic significant change, is seen in the measuring during 10 Hz stimulation, compared with the baseline measuring with the eyes closed. The independent t-Test shows a significant increase of alpha activity in the occipital, parietal and right central area of the brain. This is illustrated in picture 3 and 8 in page 1 for the FFT Absolute Power Paired t-Test. In page 3 showing the t-Test for each frequency, 8-9 Hz is the frequencies that have increased most during 10 Hz stimulation. But in page 3 illustrating FFT-absolute power difference, all the frequencies from 9-11 Hz have increased, but the most significant changes is seen in 10-11 Hz.

The dynamic FFT Absolute Power Spectrum shows an increase in 9, 10 and 11 Hz on both sides of the occipital and parietal lobe, but most significant at the right side.

9 Hz has increased from 23,59 till 82,34 AU at O2, from 53,62 till 82,34 AU at O1, from 18.50 till 41,45 AU at P3 and from 18,55 till 31,02 AU at P4.

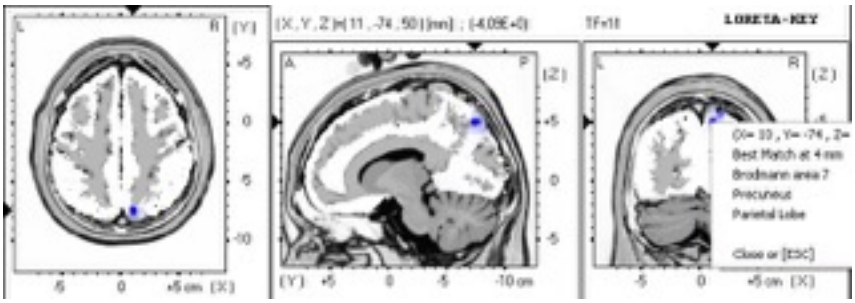
9,5 Hz has increased from 118,76 till 126,95 AU at O1, 41,82 till 81,16 AU at O2, 21,84 till 94,31 AU at P3, and from 42,13 till 90,26 AU at P4.

10 Hz has fallen from 321 till 273 AU at O1, increased from 104,99 till 184,51 AU at O2, from 53,81 till 67,79 at P3 and from 124,26 till 133,73 at P4.

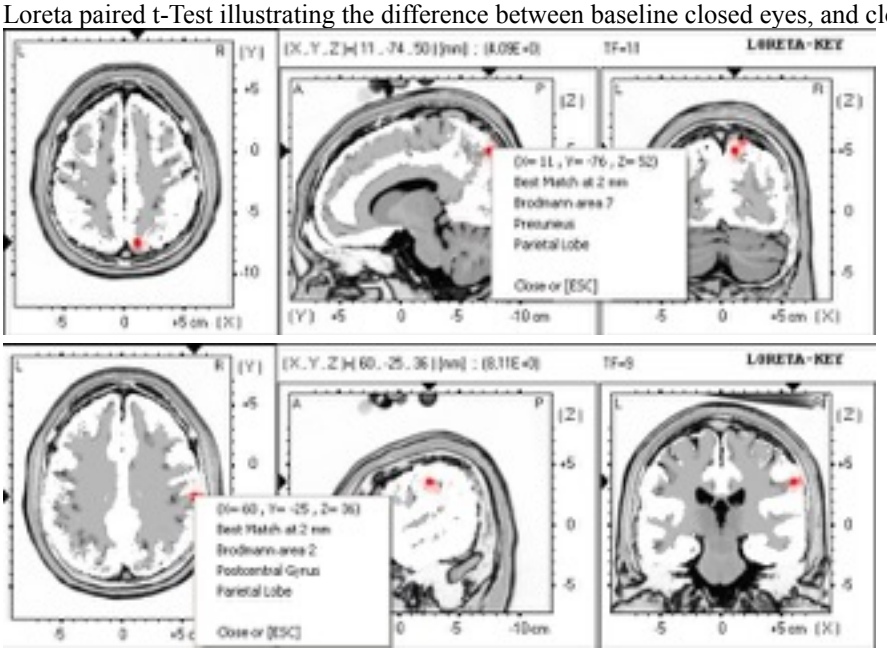
10,5 Hz has increased from 280,22 till 464,08 AU at O1, increased from 139,61 till 273,73 AU at O2, no changes at P3, but increased from 128,97 till 193,23 at P4.

11 Hz has increased from 163,16 till 308,68 AU at O1, from 50,91 till 149,05 AU at O2, from 63,45 till 67,54 AU at P3 and from 59,80 till 98,73 AU at P4.

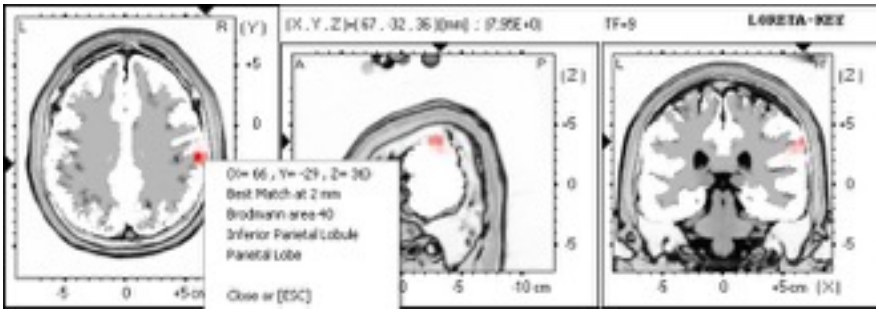
Loreta independent t-Test illustrating the difference between baseline closed eyes, and closed eyes during 10 Hz stimulation.



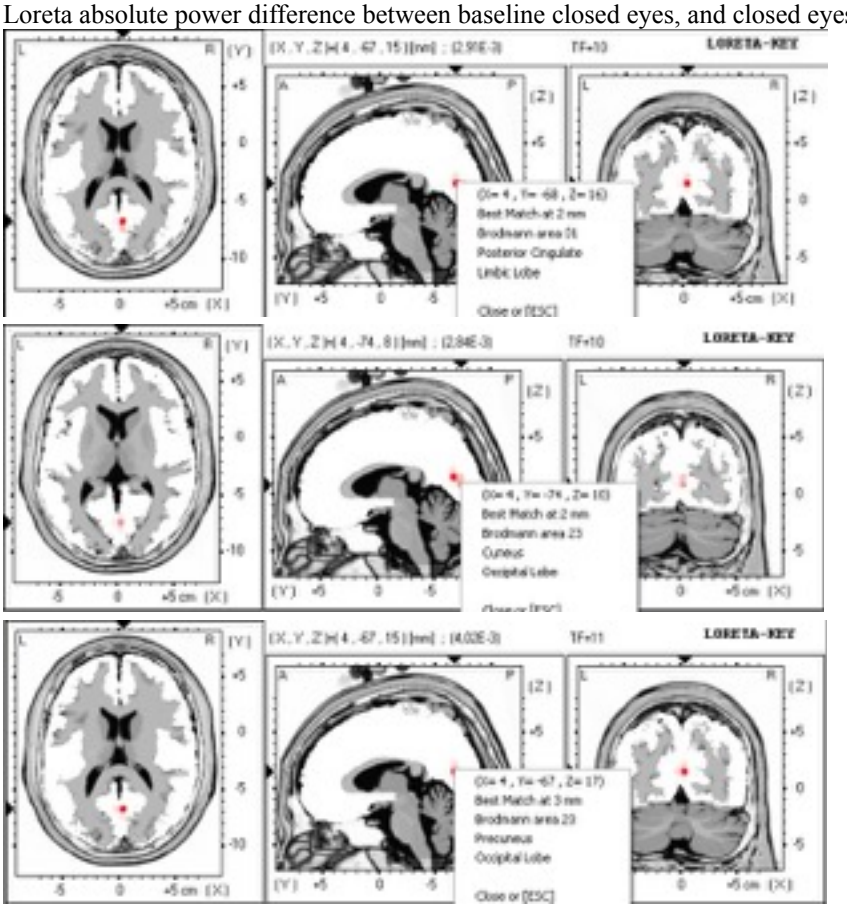
Loreta paired t-Test illustrating the difference between baseline closed eyes, and closed eyes during 10 Hz stimulation



Loreta paired t-Test illustrating the difference between baseline closed eyes, and closed eyes during 10 Hz stimulation



Loreta absolute power difference between baseline closed eyes, and closed eyes during 10 Hz stimulation



Conclusion

There is a statistical significant change in the measuring during electro magnetic stimulation in 7 and 10 Hz (with closed eyes), compared to a baseline measuring (with closed eyes).

But the change is related to a broader spectrum of brainwaves, than the electromagnetic impulses at 7 and 10 Hz. In the measuring during electro magnetic stimulation of 7 Hz, there is an increase in brain activity from 7-9 Hz, in the posterior part of the brain in particular, and the central area of the frontal lobes.

Loreta power difference, paired t-Test and independent t-Test, suggest that the increase of theta and low alpha-activity (in the measuring under 7 Hz electromagnetic stimulation) is related to the right side of Postcentral Gyrus (Brodmann area 40), right side of Insula (Brodmann area 13), right side of Superior Temporal Gyrus (Brodmann area 22), Cingulate Gyrus (Brodmann area 23 and 31), Precuneus (Brodmann area 7) and Medial Frontal Cortex (Brodmann area 6)

In the measuring during 10 Hz electromagnetic stimulation, there is a significant increase of alpha-activity from 9-11 Hz, also in the posterior part of the brain. Loreta power difference, paired t-Test and independent t-Test, suggest that the increase of alpha-activity, is related to right side of Inferior Parietal Lobule (Brodmann area 40), right side of Postcentral Gyrus (Brodmann area 2), right side of Precuneus (Brodmann area 7), in the middle of Cingulate Gyrus (Brodmann 31), and Brodmann area 23 (of Cuneus and Precuneus).

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