



# Increased duration of EEG microstates during meditation.



The KEY-Institute for  
Brain-Mind Research

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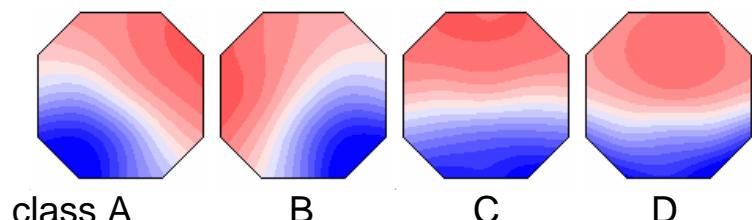
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**Introduction:** Among altered states of consciousness, meditation-induced states are of particular interest because they are willfully self-induced. Regular meditation exercises lead to rewarding subjective experiences in the direction of quiescence. Accordingly, beneficial effects of meditation might be expected and were reported in pathological mental conditions. Pathological altered states of consciousness include schizophrenia. An observation common for acute schizophrenics before treatment and for treated, chronic schizophrenics compared to controls was that the patients' EEG microstates had shortened durations (Lehmann et al., 2005) consistently in one of four microstate classes (class B). What happens with class B microstates during meditation?

**Method:** Multichannel EEG was recorded during meditation in one or more recording sessions from three very experienced meditators who were able to reach their desired states of meditation repeatedly when engaged in self-dissolution, Ch'an Mo'chao, or Vipassana, respectively. They were all also recorded during a resting control condition. Microstate analysis of the EEG data, and sorting the obtained microstates into the four standard classes of EEG microstates (classes A, B, C, D after Koenig et al., 2002) was done. Fig.1 shows these four classes. Microstate duration, occurrence, and time coverage were tested.

**Fig. 1: Four microstate classes**



**Results:** The microstate parameters of the four classes of the meditators for the resting control condition did not differ from Koenig et al's age norm values. For the meditation condition, only the duration of class B microstates of the meditators (N=3) was significantly increased compared to Koenig et al's age norm values (N=13).

**Conclusion:** While the duration of class B microstates is shortened in schizophrenics as compared to controls, the present pilot study shows an increased duration of class B microstates during meditation as compared to resting. We conclude that, considering EEG microstate duration, meditation shows brain electric characteristics (duration increase for class B microstates) that are opposite to those in schizophrenia.

## References:

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