INTRODUCTION
We have previously shown that there are systematic variations in the level of correlation and synchronisation of RSN component brain processes during different cognitive tasks. Specifically the general level of correlation and synchronisation between components was higher during a meditation on-off task than during a fingertapping task and during resting state.

The pattern of correlation and synchronisation during resting state was not obviously different from the pattern during uninterrupted meditation.

METHODS
Participants
22 participants (11 female, 11 male; mean age: 45 years; age range: 24-61 years).

Scanning design
Fingertapping: 4½ minutes of alternating between 45 seconds of finger tapping and 45 seconds of rest.
Baseline 1: 4½ minutes of rest.
Baseline 2: 4½ minutes of rest.
On-off 1: 4½ minutes of alternating between 45 seconds of meditation and 45 seconds of rest.
Continuous meditation: 30 seconds of rest followed by 1/4 minutes of meditation.

RESULTS
The distribution of correlation among components shows
1. Higher levels of correlation among components during epoch related tasks than during resting and meditation. Most pronounced in the meditation on-off scans where the distributions of correlations are bimodal.
2. Platykurtic distributions of correlations (kurtosis < 0) in the meditation on-off 1 and 2 scans, fingertapping, baseline 1, and part one of the continuous meditation scan (which comprise the shift from rest to meditation). Indicates higher variability in the distribution of correlations.
3. Leptokurtic distributions of correlations (kurtosis>0) in the meditation part 4, baseline 2, meditation part 2 and 3, indicating lower levels of variability.

The distribution of statistically significant correlations across TSAs shows
1. Overall few correlations are statistically significant in the baseline scans and during meditation.
2. Most significant correlations are in-phase (at TSA=0).
3. Statistically significant correlations which are not in-phase occur in fingertapping at various TSAs.
4. Statistically significant correlations which are approximately anti-phase occur in meditation on-off 1 and 2.
5. An exceptionally high number of statistically significant in-phase component correlations occur in meditation on-off 2.
6. Few statistically significant correlations which are not in-phase occur during continuos meditation. The phase relationship is undetermined, because the frequencies of activity variations in components is not coupled to the 45 second epoch length during meditation.

The representative example of RSN e correlation with other RSN components illustrates
1. The resting state during baseline 1 is more similar to the epoch related scans (fingertapping, meditation on-off) than during baseline 2.
2. The resting state during baseline 2 is more similar to the continuous meditation scan than during baseline 1.
3. The variations of the activity level is more tightly coupled to the epoch-related task structure during meditation on-off than during fingertapping.
4. The coupling of the variations of the activity level to the epoch related task structure is exceptionally high during meditation on-off 2.
5. All components show a high frequency of variations of the activity level during continuous meditation.

DISCUSSION AND CONCLUSION
During cognitive tasks (fingertapping, meditation on-off) the RSN components display correlated activity. The correlation of components may reflect their linking together (clustering) to form functional systems which realizes the given cognitive task. The level of correlation seem to correspond to the amount of cognitive resources involved in the realization of the task.

The differences between fingertapping and meditation on-off may indicate that alternating between meditation and rest is a more cognitively involving task than alternating between fingertapping and rest. The low mental effort required while fingertapping leaves the mind largely free to wander as during resting state.

During resting state (baseline 1 and 2) the pattern of RSN correlations was similar to the pattern in fingertapping and continuous meditation respectively. This reflect differences in the amount of cognitive activity (thinking), and the influence of previous experience on the momentary resting state activity.

The meditation on-off scanning sessions reflect the shift to meditation, which appears to present a major cognitive challenge involving all RSN components in synchronised activity. The higher level of correlation and synchronisation of RSN activity in meditation on-off 2 compared to meditation on-off 1 may indicate higher cognitive involvement and control in the second session compared to the first, presumably stimulated by the continuous medi- tation.

The pattern of decorrelation of RSN components during continuous meditation may be interpreted as the achievement of “dynamic stability” of the mind by adaptive compensations for externally and internally generated disturbances of attention (i.e. sensory impressions, and thoughts and associations).

During resting state the level of correlation may correspond to the distraction and discontinuity characterizing an unconstrained mind spontaneously wandering from thought to thought (i.e. “disturbances” in the terms of Patanjali). During meditation on-off all components become locked together in the attempt to shift from unstructured thinking (mind wandering) into meditation. The especially low level of correlation during continuous meditation may correspond to the maintenance of a focused state of mind, where attention is not caught by any particular thought or impression (i.e. non-thinking or “concentration” in the terms of Patanjali).