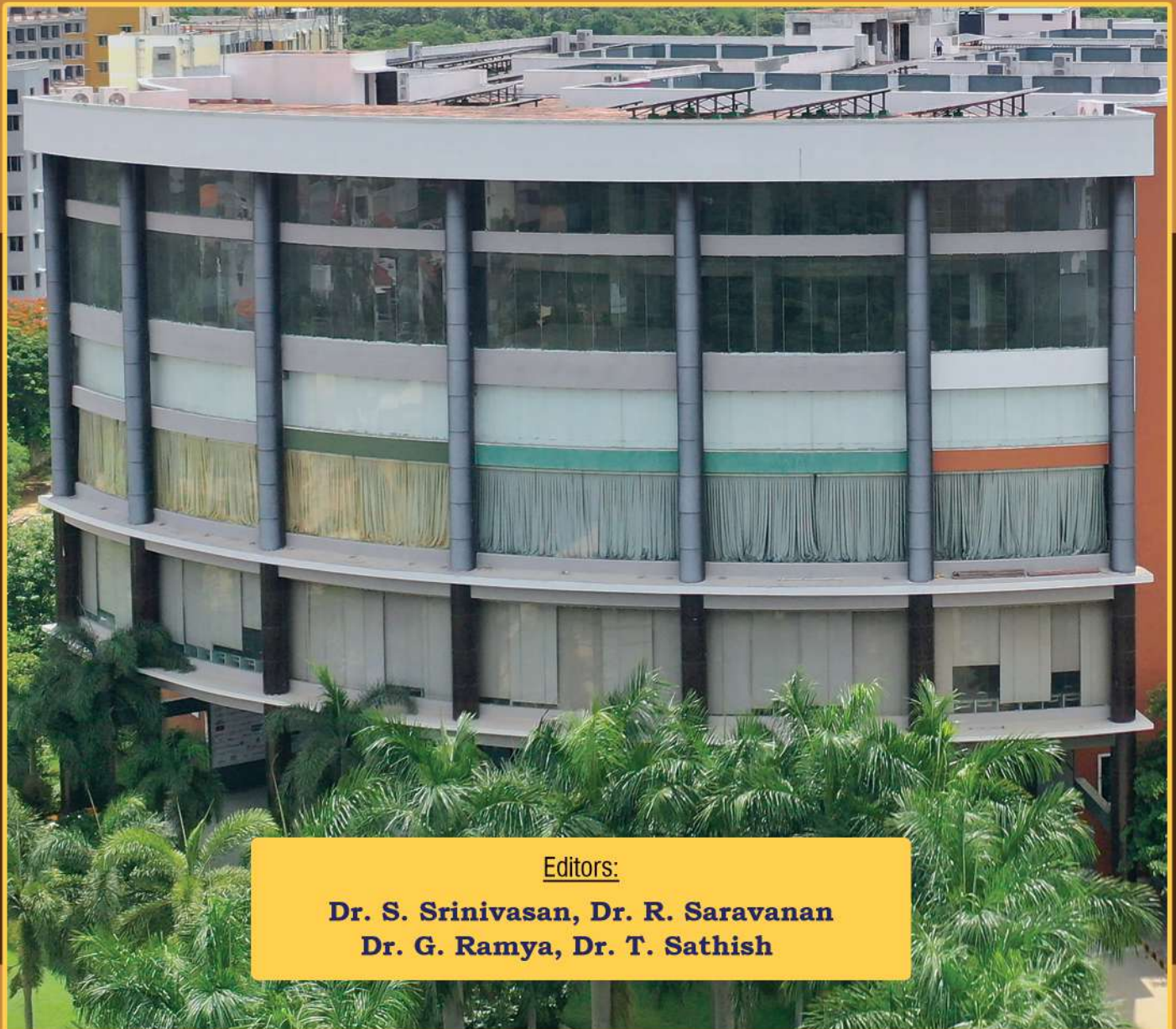# International Conference on
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PERIODIC VARIATION OF ECG, EEG AND RESPIRATION SIGNALS IN DIFFERENT PHYSIOLOGICAL STATES OF SLEEP APNEA SUBJECTS

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ABSTRACT

In the present work, a novel technique was used to identify Sleep (SL), Wake (WA), Apnea (AP), Hypopnea (HY) and Onset-of-Apnea (OA) stages for Obstructive Sleep Apnea (OSA) subjects from full night monitoring of polysomnography (PSG) at sleep laboratories. In this methodology, present stages of an OSA subject during sleep can be identified using only single cycle of respiration signal, ECG signal and EEG signal during the respiration interval. A trajectory was formed by assigning these three signals into three orthogonal axes where the spatial distribution of the trajectory was found to be varied with the different stages of OSA subjects. The discriminating information regarding different stages was extracted from the spatial distribution by dividing the whole hyperspace into equal sized subspaces and the persistence of the trajectory in a particular subspace was considered as feature. Dimension reduction techniques Factor Analysis (FA) were investigated where three Factor Components (FCs) were identified. Our approach will help to understand how the integrated system behaves during different physiological functions. Further, it could provide a potential direction to understand the development of sleep related disorders including sleep apnea.

Keywords:ECG, EEG, Factor Analysis, Obstructive Sleep Apnea**.**