# Characterization of Autonomic Dysfunction in REM Sleep Behavior Disorder

Nicla Mandas, Maximiliano Mollura, Giulia Baldazzi, Michela Figorilli, Monica Puligheddu, Danilo Pani, Riccardo Barbieri

Politecnico di Milano, Milano, Italy

**Introduction:** REM sleep behavior disorder (*RBD*) is a parasomnia characterized by the loss of REM sleep atonia. Subjects affected by RBD tend to enact their dreams, ranging from safe hand gestures to more violent behaviors.
**Goal:** This work aims to characterize autonomic dysfunction in RBD subjects using heart rate variability (HRV) indexes computed from electrocardiogram recordings during polysomnographic studies.
**Methods:** Sleep stages of 17 healthy control and 22 RBD subjects were scored following the American Academy of Sleep Medicine guidelines. RR intervals from the first epoch of every sleep stage were extracted and a point process framework was used to estimate time-varying indexes of autonomic control.
**Results:** RR variance ($\sigma^2$) is significantly lower in RBD both in N1 ($p$=0.018) and N3 ($p$=0.035). HF power (vagal control) shows a statistically significant difference between the two populations in sleep stages N3 ($p$=0.008) and REM ($p$=0.028) with higher medians in the healthy subjects. Median HF power in healthy subjects reduces while moving from NREM to REM stage, whereas medians of RBD group have similar order of magnitude in all sleep stages, always smaller than healthy controls.
**Conclusions:** Results point at an overall reduction of HRV in RBD than healthy controls, supported by the observed lower $\sigma^2$, and LF and HF powers, mainly in N3 and REM sleep stages. The well-known sympathetic activation in REM stage is observed in the control group. On the contrary, RBD subjects showed higher normalized HF power during sleep, possibly indicating an impaired sympathetic activation in RBD subjects.