Poster Session #F
Gravitational Wave detectors and other sources

F10

External environmental noise influences on Virgo during O3

Irene Fiori (EGO Pisa)

Sources of geophysical and anthropogenic noise, such as wind, sea, earthquakes, local traffic, etc. can impact gravitational wave interferometers by causing sensitivity drops and lock losses. During the 1-year long O3 observation run, the Virgo Collaboration collected a statistically significant sample of data to study the response of the detector to a variety of environmental conditions. We used this dataset to correlate various environmental parameters to quantities that monitor detector performance, such as its observation range and duty cycle. Where possible, we identified weaknesses in the detector and worked out strategies to be implemented to improve Virgo robustness against external environmental disturbances for the next observing run O4, planned for summer 2022. The lessons learned could provide useful insights for the design of the next generation of ground-based interferometers.