

The Advanced Virgo Interferometer Sensing and Control for the O3 scientific run

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Following a successful period of data-taking in the Summer of 2017, the Advanced Virgo gravitational-wave detector was further commissioned to improve its sensitivity in view of the O3 scientific run together with the Advanced LIGO detectors. The major improvements performed during this commissioning period from the end of 2017 to the beginning of 2019 were devoted to lower the suspensions thermal noise, thanks to the improvement obtained with fused silica suspensions, and to improve the quantum noise, thanks to the implementation of the squeezing and the increase of input power. The improvement on the ITF sensitivity led to an increase on the interferometer performance requirements, especially for a low cavity stability such as the Advanced Virgo recycling cavity, indeed strong efforts have been put also on the Interferometer Sensing and Control system to further improve the ITF reliability and performance. This paper will describe the control of the longitudinal and angular degrees of freedom in the Advanced Virgo instrument developed in view of the O3 science run, showing the performance and the overall ITF stability.