

Study of the control losses of the Virgo gravitational-wave detector in data-taking mode during the O3 run (2019/04 – 2020/03)

A high duty cycle is a key requirement for a ground-based interferometric gravitational-wave (GW) detector like Virgo: both to maximize the probability to be taking data when transient GW signals pass by and to accumulate enough data to look for continuous sources of GW. To be sensitive to GW, the instrument must be actively controlled in order to reach and remain at its nominal working point. When that control is lost, it should be re-acquired, a procedure that usually takes a few tens of minutes that are thus thrown away. Therefore, studying why the control has been lost each time this happens is mandatory to improve the overall performance of the detector. In this talk, we present a study of the control losses that have affected Virgo during the LIGO-Virgo Observation Run 3 (O3 run). After having described the analysis procedure, we will focus on the main results of this study and conclude by describing the improvements that are planned for the forthcoming O4 run, from Summer 2022 onwards.