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New Instrumented Baffles for the Main Optical Arms of the Virgo Experiment

Building on the successful four-year operation of the first instrumented baffle installed on the Input Mode Cleaner (IMC) mirror of Virgo in 2021, IFAE has developed two new large instrumented baffles for deployment in the main arms of the detector. Each baffle, approximately 80 cm in diameter and equipped with 120 photosensors, will be installed at the entrance of the input mirror towers. The system features a 1 kHz DAQ readout and supports both wired and wireless operation.

We will present the design and construction of these baffles, together with performance studies validated through detailed simulations. The new instrumentation is expected to provide continuous monitoring of stray light within the arm cavities, assist in cavity pre-alignment during commissioning and operation, support the validation of optical stray-light models, and aid in the identification of potential noise sources by correlating baffle data with glitches observed in the interferometer output and control channels.

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