



Contribution ID: 110

Type: talk

Stray-light control in KAGRA

Wednesday, 19 May 2021 06:45 (15 minutes)

In this talk, we will introduce several aspects of stray-light control in the KAGRA interferometer. The stray light to be controlled include ghost beams and scattered light produced at optics and mechanical structures in the interferometer and recombined somehow back into the main beam path. These unwanted lights could become critical noise in the end. Although the stray-light noise can be described in a simple formalism of phase fluctuations imprinted on the stray light until the recombination, the actual behaviors of the resultant noise are not always simple. So, the prediction of the behaviors is quite uncertain. To suppress the noise, optical baffles, dumps, or shields in (or out of) vacuum chambers need to be designed under a good connection with those of mechanical stuff like vibration-isolation systems in the very first place, while the seriousness of this noise is not always shared. One should consider the design concept also from the viewpoint of safety if using a high-power laser source. Thus careful engineering, which might be sometimes overlooked by scientists, would be necessary. Summarizing our activities so far would be useful for the detailed design of future interferometers.

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Session Classification: Scattered light workshop

Track Classification: Workshops: Scattered light workshop