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SiN films: characterization workflow and examples from analysis

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SiN has emerged as one of the most promising materials for the next-generation optical coatings in the mirrors of GW detectors. Optical absorption is currently one of the most critical parameters affecting the performances of SiN films, as a very low absorption is required for GW applications; optical absorption may arise from a variety of causes, including non-ideal stoichiometry and contaminants, which in turn are determined by the fabrication process of the films. In order to tackle the issue of optical absorption in SiN films, a significant effort has been undertaken within the Virgo Coating R&D Collaboration (VCRED), and multi-technique characterization is ongoing to provide information so that the causes of optical absorption are identified and, where possible, minimized during the fabrication of SiN films at LMA.
This talk will provide an overview of the SiN films produced by LMA and characterized within VCRED; a few examples from the ongoing analysis will be presented, in order to clarify the key parameters that affect the performance of SiN films for GW applications.

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