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Summary of MAD substrate discussion

Identifying suitable substrate materials is a key challenge for the development of future cryogenic gravitational-wave detectors. Achieving both low thermal noise and low optical absorption is critical for ensuring detector sensitivity and stable cryogenic operation. At the Materials for Advanced Detectors (MAD) workshop, that held in October at IKZ (Berlin) these challenges will be discussed extensively, with particular focus on crystalline silicon and sapphire as leading substrate candidates. Each material offers clear advantages, but also presents open questions regarding surface absorption, scattering, production, coating integration and so on. With this contribution, I will present an overview of the substrate-related discussions at MAD, highlighting the current understanding, unresolved issues, and ongoing efforts to advance mirror substrates for next-generation detectors.

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