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Polishing and characterisation of sapphire substrates for third-generation gravitational wave detectors in Lyon.

Monday 6 October 2025 13:00 (15 minutes)

In Lyon, we are investigating the potential of using sapphire mirrors for the Einstein Telescope Low-Frequency (ET-LF) detector. Compared to silicon, sapphire offers several advantages in cryogenic environments. These include superior thermal conductivity, higher density and optical transparency across the visible and the near infrared spectrum. Although KAGRA currently uses sapphire test masses, there is still limited R&D activity focused on this material. At the University of Lyon campus, we grow, polish and characterise sapphire substrates. This presentation will focus on our progress in the polishing process, in which we have achieved a flatness of $\lambda/60$ in the central region. The presentation will also include our plan for future developments.

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