

## Magnetic noise mitigation for Einstein Telescope: optimization of ferromagnetic shielding

At low frequencies (1-100 Hz), the dominant noise sources for the Einstein Telescope (ET) will be of seismic and magnetic origin. In particular, magnetic noise can be categorized into natural noise, primarily caused by Schumann resonances, and self-inflicted noise, generated by the interferometer's own electronics.

Based on experience from Virgo, achieving the target sensitivity will require reducing natural magnetic noise by at least a factor of three and self-inflicted noise by at least a factor of 100 [1]. Natural noise can only be mitigated by shielding the interferometer's sensitive components. In contrast, reducing self-inflicted noise requires a dual approach: shielding the sensitive components, as with natural noise, and directly mitigating noise sources by shielding them at the origin.

This poster provides an overview of key magnetic noise mitigation techniques, with a particular focus on the use of ferromagnetic materials for shielding. The poster highlights the benefits and limitations of this approach, emphasizing the need for an optimized and strategic placement of ferromagnetic shielding to maximize effectiveness.

Reference:

[1] Amann, F. et al. Site-selection criteria for the Einstein Telescope. Review of Scientific Instrument. <https://doi.org/10.1063/5.0018414>

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