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Discriminating between correlated magnetic noise and a gravitational-wave background

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Ground-based gravitational-wave detectors are becoming more sensitive, and in the near future we hope to detect a gravitational-wave background. However, as these detectors become more sensitive they will continue to run into new forms of noise. Correlated noise between spatially separated detectors will limit our intrinsic sensitivity, and have the potential to give a false detection. In this talk, we discuss long-wavelength magnetic fields, which are a likely source of correlated detector noise. First, we will discuss how these long-wavelength fields can couple into gravitational-wave detectors. Next, we will discuss a novel Bayesian technique for separating correlated magnetic noise from a gravitational-wave background. Finally, we will discuss how we applied the new method to data from Advanced LIGO and Virgo's third observing runs.

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