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The hunt for high frequency gravitational waves — GravNet: a global network of HFGW detectors

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A new window to the universe was opened up with the detection of gravitational waves. While observations have been made at frequencies around hundreds of herz, and evidence was found at nHz frequencies, the high frequency region is still unexplored experimentally. To change this the GravNet initiative was founded with the aim to setup a global network of high frequency gravitational wave detectors.
The idea of searching for gravitational waves using radio frequency cavities immersed in strong magnetic fields has recently received significant attention. In particular, cavities with rather small volumes that are currently used to search for axion-like particles are discussed in this context. The first three detector of the GravNet network are under construction employing RF-cavities. Several sources of high frequency gravitational waves are discussed in new physics models, most prominently primordial black hole merges and axion super-radiance. Both production mechanisms lead to signals with distinct features. Challenges of detecting gravitational waves from both exemplary sources are discussed as well as prospects for the detection of GW using the network of RF cavity based detectors.

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