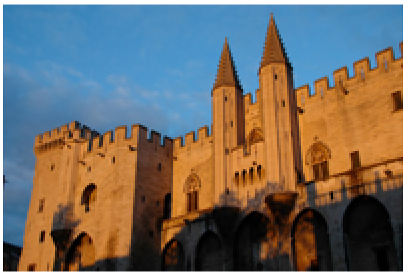

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Searching for anisotropic stochastic GW backgrounds with constellations of space-based interferometers

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The anisotropies of the astrophysical stochastic gravitational-wave background (SGWB) encode an extraordinary amount of cosmological information, as they are a new unexplored tracer of the Large-Scale Structure. On the other hand, many recent studies have pointed out the difficulties of measuring these spatial fluctuations, even with a network of next-generation detectors, such as the Einstein Telescope and the Laser Interferometer Space Antenna (LISA). The two main obstacles are the shot noise and the poor angular resolution of GW instruments. The former issue is due to the discreteness of GW sources in space and time. Hence, the shot noise is intrinsic and can't be reduced or removed: the only way to alleviate its impact is to cross-correlate the SGWB with other tracers of the Large-Scale Structure. The second obstacle is the instrumental noise and, in particular, the poor localization power of GW detectors. Since a straightforward way to improve a network's angular sensitivity is to increase the distance among the detectors, a constellation of space-based instruments could be an ideal configuration to achieve the required angular resolution. After a brief introduction to SGWB anisotropies and their detection prospects, I will present the results of our recently published paper Capurri et al. 2023 ApJ 943 72, where we analyze the potential of two different detector constellations: the proposed Japanese mission DECi-hertz Interferometer Gravitational-wave Observatory (DECIGO) and a set of LISA-like detectors in heliocentric orbit. Specifically, we study the detection prospects for the SGWB anisotropies by focusing on auto- and cross-correlation signals.

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