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Sparse data inpainting for the recovery of gapped gravitational waves signals

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The detection of galactic binaries as sources of gravitational waves promises an unprecedented wealth of information about these systems, but also raises several challenges in signal processing. In particular, the variety of sources and the presence of both planned and unplanned gaps call for the development of robust methods. We describe here an original non-parametric reconstruction of the imprint of galactic binaries in measurements affected by instrumental noise and data gaps both typical of the space-based gravitational wave observatory LISA. We carefully show that a sparse data representation gives a reliable access to the physical content of the interferometric measurement, even when the data is gapped. In particular we check the successful extraction of the gravitational wave signal on a simple yet realistic example involving verification galactic binaries recently proposed in LISA data challenges.

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