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Continuous wave and long-transient signals from newborn magnetars: status and prospects for detection

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The search for continuous wave (CW) sources represents a new frontier of gravitational wave astronomy. The current and future LVK science runs may eventually reach the required sensitivities for the first detection of a rotating, distorted NS. At the same time, increasing efforts are being devoted to the search of long-transient signals (a few hours long) from newly born magnetars, a special class of NS expected to have particularly fast rotation and large mass quadrupole. Long transients bear some resemblance to CW signals, while posing specific challenges in terms of data analysis and of observing strategies, which strongly require a multi-messenger approach. I will review the current status and the outlook of such efforts, with special emphasis on their synergies with electromagnetic observations, the new ideas they have inspired and their potential for breakthrough discoveries.

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