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Supercooled Audible Axions

We present the audible axion mechanism extended by a period of supercooling that delays the onset of axion oscillations. While the original setup relies on a large axion decay constant and coupling to a dark Abelian gauge field to produce sizable gravitational wave signals, in this talk we discuss how supercooling opens up the testable parameter space and reduces the required coupling to α
$gtrsim1$.
Added to that, we showcase that the emission of gravitational waves via the axion coupling to the Standard Model photon in the presence of Schwinger pair production becomes possible, generating a strong signal in the μHz or ultra-high frequency range.

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