# Periodic approximants of one-dimensional quasicrystals

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Quasicrystals have exotic spectra that are challenging to understand and are the basis of several longstanding problems in spectral analysis. In the applied physical literature, however, there is a common tendency to approximate the spectrum of a quasicrystal with a periodic approximation, known as a supercell. In this work, we prove that supercell approximations give accurate predictions of the main spectral gaps of Fibonacci quasicrystals. This is based on characterising the growth of the underlying recursion relation and corroborates the existence of previously observed "super band gaps". We demonstrate our results through applications to simple one-dimensional wave systems, including a strategy for creating localised edge modes.