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Quantum resolution of timelike singularities in spherically symmetric, self-similar spacetimes DEBORAH KONKOWSKI, U.S. Naval Academy, THOMAS HELLIWELL, Harvey Mudd College, JON WILLIAMS, U.S. Naval Academy — A definition of quantum singularity for the case of static spacetimes has recently been extended to conformally static spacetimes. Here the theory behind quantum singularities in conformally static spacetimes is reviewed, and then applied to a class of spherically symmetric, self-similar spacetimes. We use solutions of the massless Klein-Gordon equation as test fields. In this way we find the ranges of metric parameters for which classical timelike singularities in these spacetimes are resolved quantum mechanically, in the sense that the Hamiltonian operator is essentially self-adjoint, so the evolution of quantum wave packets lacks the usual ambiguity associated with scattering off singulartities.

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