Resonances for perturbed Dirac operators

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We prove the existence of quantum resonances of the three-dimensional Dirac operator perturbed by smooth, bounded and real-valued scalar potentials V decaying like $\langle x \rangle^{-\delta}$ at infinity for some $\delta > 0$. By studying analytic singularities of a certain distribution related to V and by combining two trace formulas, we prove that the perturbed Dirac operators possess resonances near $\sup V + 1$ and $\inf V - 1$. Furthermore, for smooth compactly supported Hermitian matrix $V(x)$, we establish a global Poisson wave trace formula.