A strategy for self-adjointness of Dirac operators

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Abstract

We are interested in self-adjoint realizations of the Dirac operator for two models: the MIT bag model and the Dirac operator coupled with an electrostatic delta interaction supported on a smooth compact surface without boundary.
To do so, we develop a strategy using Calderon projectors and apply it to the two models we are interested in. The question of self-adjointness is solved for the two models considered. It is interesting to remark that for the Dirac operator coupled with the electrostatic delta-shell, a critical coupling constant appears: The operator is essentially self-adjoint with functions in its domain less regular than for the other coupling constants. This is joint work with Luis Vega.

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