MAFIA - the seminar you can't refuse

Nonrelativistic limit of generalized MIT bag models

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November 29 (**Wednesday**), 2023
12:00–13:00
in **T112** (1st floor)

Fakulta jaderná a fyzikálně inženýrská ČVUT
Trojanova 13, 12000 Praha

Abstract: In this talk three-dimensional Dirac operators in domains with compact boundary subject to boundary conditions making them self-adjoint are considered. The mentioned boundary conditions generalize the MIT bag boundary conditions that are used in particle physics. As a main result it is discussed that in the nonrelativistic limit, i.e. when the energy of the resting particle is subtracted and the speed of light c is sent to $+\infty$, these Dirac operators converge to the Dirichlet Laplacian. In particular, this allows to transfer known results on the spectrum of the Dirichlet Laplacian (like, e.g., the Faber-Krahn inequality) to the generalized MIT bag models for large values of c. The talk is based on a joint work with J. Behrndt, D. Frymark, and C. Stelzer-Landauer.