

EDPs Seminar

Speaker: Marie Fialova (University of Copenhagen, Dinamarca)

Title: Aharonov--Casher theorem on manifolds with boundary and APS boundary condition.

Abstract: The Aharonov--Casher (AC) theorem is a result from 1979 on the number of the so-called zero modes of a system described by the magnetic Pauli operator in $\mathbb{R}^2$. In this talk I will address the same problem for the Dirac operator when $\mathbb{R}^2$ is exchanged by a certain two dimensional manifold with a boundary. More concretely I consider a plane, disc and sphere with a finite number of circular holes cut out. The magnetic field consists of two contributions; a smooth compactly supported field on the manifold, and Aharonov--Bohm solenoids generating magnetic field inside the holes. For the Dirac operator in this setting we take the domain given by the famous Atiyah--Patodi--Singer global boundary condition.

Similarly as in the AC theorem, the number of the zero modes depends only on the magnetic flux also in the cases above. Moreover, the values of the fluxes through the holes matter only up to an integer multiple of 2π .

The talk is based on my PhD project supervised by J.P. Solovej.

Zoom:

<https://uchile.zoom.us/j/84114871363?pwd=WjlzcURRbXB4YTcvNIUzamNxQWJVdz09>

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