

Mathematisches Oberseminar *PDG und Spektraltheorie* (WiSe 2016/17).

Date: 02.02.2017.

Time and place: 14:15 in B 134.

Speaker: Daniel Teetz (LMU).

Titel: *Spectral phase transitions and non-semiclassical behaviour.*

Abstract: Quantum systems depending continuously on some parameter λ may exhibit a sudden change in their behaviour along the variation of λ . This phenomenon is what we call a spectral phase transition. We study a system that was introduced by Barseghyan and Exner in 2012 which features a potential unbounded from below with infinite phase space volume below any energy. The potential depends linearly on a coupling parameter λ , where a spectral phase transition happens at a certain critical value of λ .

We discuss recent results by Barseghyan et al.: In the supercritical case, any energy is allowed. This is the expected behaviour from semiclassical analysis, since the classical phase space volume below any energy is infinite. In contrast to this, the energy levels are purely discrete and bounded below for subcritical values of λ . In this case, the system also admits Lieb-Thirring-type eigenvalue bounds, although the semiclassical approximation still yields infinite values.

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