Spectral multiplicity of Schrödinger operators on star-graphs

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We consider the Schrödinger operator on a star-graph with n finite or infinite edges and the standard interface condition at the origin. We are interested what the local spectral multiplicity of this operator is. The answer is expected in terms of the spectral measures μ_l, $l = 1, ..., n$, of the Schrödinger operators on the edges with Dirichlet boundary condition at the origin. For $n = 2$ such a situation is described by Kac theorem. It says in particular that the singular spectrum of the operator on the whole graph (just the real line in that case) is always simple. We will discuss a generalisation and refinement of Kac result for the case $n > 2$. The answer depends on the type of the spectrum, i.e., is different for its absolutely continuous and singular parts with respect to the Lebesgue measure and to the measure $\mu = \sum_{l=1}^{n} \mu_l$. In particular, the multiplicity of the singular spectrum cannot exceed $(n-1)$, but can be smaller.

The talk is based on a joint work with H. Woracek.