Approximate Isometries as an Eigenvalue Problem and Angular Momentum SHAWN WILDER, CHRIS BEETLE, Florida Atlantic University — In relativistic physics, a precise definition of a black hole's angular momentum is possible only when its horizon possesses an axial symmetry. Unfortunately most black hole horizons have no such symmetry. However, it is possible to pose an eigenvalue problem that has solutions corresponding to any manifold's "approximate Killing fields." This allows one to generalize formulae requiring symmetry to cases where no symmetry is present and thus define, for example, the spin of an arbitrary black hole. This talk will discuss work using perturbation theory of a horizon to quantify the stability of quantities generalized in this way. We will present precise conditions for the stability of solutions to the eigenvalue problem, and discuss potential applications to numerical relativity.

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