SUPERRADIANT INSTABILITY OF A CHARGED REGULAR BLACK HOLE

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We show that a charged, massive scalar field around an electrically-charged Aýon-Beato-García regular black hole has a spectrum of quasibound states that (in a certain parameter regime) grow exponentially with time, due to black hole superradiance. Superradiant quasibound states are made possible by the enhancement of the electrostatic potential at the horizon in nonlinear electrodynamics. For its turn, the Reissner-Nordstrom black hole does not possess such superradiant quasibound states. We otain the spectrum for a range of multipoles l across the parameter space, and we find the fastest growth rate in the monopole mode. Finally, we consider the stationary bound states at the superradiant threshold, and we conjecture that, due to this instability, the ABG black hole will evolve towards a configuration with charged scalar hair.