



Regular black holes in Einstein-Mawell theory

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Regular black hole solutions are found from general relativity coupled to Maxwell's electromagnetism and charged matter. We consider spherically symmetric charged perfect fluid distributions whose metric potentials and electromagnetic fields are related in some particularly simple form. We show that, there are objects which correspond to regular charged black holes, whose interior region is filled by a charged phantom-like fluid, or, in a limiting case, de Sitter, and whose exterior region is Reissner-Nordström. The boundary between both regions is a smooth boundary surface, except in the limiting case where the boundary is made of a massless electrically charged spherically symmetric shell. The main physical and geometrical properties of such charged regular solutions are analyzed.