Optical and Acoustic Black Holes

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Abstract. Optical or acoustic black holes are the black holes of the wave equations describing the propagation of light or sound in the moving medium. They are sometimes called the artificial black holes to distinguish them from the black holes of general relativity when the metric satisfies the Einstein equations. We shall study conditions of the existence of black and white holes in the case of two space dimensions and in the axisymmetric case. We also study the stability of black and white holes with respect to the perturbations of the metric, in particular, the stability of the Kerr black hole.