

Global geometry of the Vaidya metric

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We find the exact analytical expressions for metric functions of the classical Vaidya metric in the diagonal coordinates in the case of the linear mass function. By using these coordinates, we elaborate the maximum analytic extension of the Vaidya metric with a linear growth of the black hole mass and construct the corresponding Carter-Penrose diagrams for different specific cases. The derived global geometry seemingly is valid also for a more general behavior of the black hole mass in the Vaidya metric.

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