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Reconstruction of a star motion in the vicinity of black hole from the redshift of the electromagnetic spectrum

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The problem of calculating of redshift of electromagnetic spectrum of the star, moving in the vicinity of Schwarzschild black hole is solved in the framework of General Theory of Relativity. The inverse problem: determining of the parameters of motion of a star from observational data of redshift is considered. The approach that gives possibilities to solve the inverse problem is proposed. The approach is tested on the numerical model that gives possibilities to calculate redshift as function of time of observation for a star moving in the vicinity of Schwarzschild black hole. The parameters of the star in numerical model are close to parameters of the S-stars, moving in the vicinity of the Sgr A*.

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