

Gravity assist as a test of relativistic gravity

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We consider the gravity assist maneuver, that is, a correction of spacecraft motion at its passing near a planet, as a tool for evaluating the Eddington post-Newtonian parameters β and γ , characterizing vacuum spherically symmetric gravitation fields in metric theories of gravity. We estimate the effect of variation in β and γ on a particular trajectory of a probe launched from the Earth's orbit and passing closely near Venus, where relativistic corrections slightly change the impact parameter of probe scattering in Venus's gravitational field. It is shown, in particular, that a change of 10^{-4} in β or γ leads to a shift of about 50 km in the probe's aphelion position.

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