Contributed talk

CONSTRAINTS ON $f(R,\phi)$ (SANDERS-LIKE) GRAVITY POTENTIAL FROM ORBIT OF S2 STAR

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We investigate the possibility to explain theoretically the S2 star orbital precession around the massive object at the Galactic Centre using Extended Theories of Gravity [1], specifically $f(R,\phi)$ a Sanders-like [2] gravitational potential in total absence of dark matter. To this aim an analytic fourth-order theory of gravity, non-minimally coupled with a massive scalar field is considered. The interaction term is given by an analytic functions $f(R,\phi)$ where R is the Ricci scalar and ϕ is the scalar field. We simulated orbit of S2 star around the Galactic Centre in Sanders-like gravity potentials and compared it with NTT/VLT observations. We presented maps of reduced χ^2 over the $\{\alpha - m_\phi\}$ parameter space in the case of NTT/VLT observations. The approach we are proposing [3,4] seems reliable to constrain modified gravity models at astronomical level.

REFERENCES

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