Poster Session #B
Observational and space tests of gravitation

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Constraining massless dilaton theory at solar system scales with the planetary ephemeris INPOP

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In this poster we present the results obtained with the INPOP planetary ephemerides in term of constraining the phenomenology of the massless dilaton theory in the Solar system. We expose the phenomenology of the massless dilaton theory in the Solar system for a non universal quadratic coupling between the scalar field which represents the dilaton, and the matter: modified post-Newtonian equations of motion of an N-body system and the light time travel are derived from the action of the theory. We use the physical properties of the bodies of the Solar system to reduce the number of parameters to be tested to 3 in the linear coupling case, and 6 in the quadratic coupling case. In the linear case, we have an universal coupling constant α_0 and two coupling constants α_T and α_G related respectively to the telluric bodies and to the gazeous bodies. In the quadratic case, the 3 supplementary constants are β_0, a quadratic universal coupling constant, and $d\beta^T$ and $d\beta^G$, quadratic non universal coupling constants related respectively to the telluric bodies and the gazeous bodies. Then we use the last version of our planetary ephemeris, INPOP19a, in order to constrain these constants.