Observational Constraints on Transverse Gravity: a Generalization of Unimodular Gravity

J.J. Lopez-Villarejo

(Submitted on 20 Jan 2010)

We explore the hypothesis that the set of symmetries enjoyed by the theory that describes gravity is not the full group of diffeomorphisms Diff(M), as in General Relativity, but a maximal subgroup of it, TransverseDiff(M), with its elements having a jacobian equal to unity; at the infinitesimal level, the parameter describing the coordinate change, xi^mu (x), is transverse, i.e., partial_mu(xi^mu)=0. Incidentally, this is the smaller symmetry one needs to propagate consistently a graviton, which is a great theoretical motivation for considering these theories. Also, the determinant of the metric, g, behaves as a "transverse scalar", so that these theories can be seen as a generalization of the better-known unimodular gravity. We present our results on the observational constraints on transverse gravity, in close relation with the claim of equivalence with general scalar-tensor theory. We also comment on the structure of the divergences of the quantum theory to the one-loop order.

Comments:	Prepared for the First Mediterranean Conference on Classical and Quantum Gravity, MCCQG, Kolymbari (Crete, Greece), 14-18 September, 2009; also, ERE2009: Gravitation in the Large, Bilbao (Spain), 7-11 September, 2009
Subjects:	**High Energy Physics - Theory (hep-th)**; General Relativity and Quantum Cosmology (gr-qc); High Energy Physics - Phenomenology (hep-ph)
Cite as:	**arXiv:1001.3649v1 [hep-th]**

Submission history

From: Juan Jose Lopez-Villarejo [view email]
[v1] Wed, 20 Jan 2010 18:46:00 GMT (16kb)

Which authors of this paper are endorsers?

Link back to: arXiv, form interface, contact.