

We analyze the Hamiltonian structure of a general theory of bi-gravity where the interaction term is a function of the form $V(\text{Tr}\sqrt{g-1f})$ or $V(\text{Tr}(g-1f))$. We give necessary conditions for the interaction term of such a theory to be a ghost free. We show that in the bi-gravity of Hassan and Rosen, there exist enough additional constraints for omitting the ghost and generating diffeomorphism, as well. Our analysis shows that a model with $V(\text{Tr}(g-1f))$, in principle is possible to be ghost free.