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# A connection between linearized Gauss–Bonnet gravity and classical electrodynamics

*Monday, 3 June 2019 14:15 (15 minutes)*

The oral presentation will consist primarily of a recently published article in International Journal of Modern Physics D entitled "A connection between linearized Gauss–Bonnet gravity and classical electrodynamics", authored by MR Baker and S Kuzmin. In this article, a connection between a well known gravitational model and classical electrodynamics is derived. Given the excitement among physicists regarding the relationship between the fundamental interactions of nature, this should be an interesting talk for all audiences. A more formal abstract from the article regarding technical contents within is given in the next paragraph, however the talk will be less technical than the contents of the article.

Content abstract: A connection between linearized Gauss–Bonnet gravity and classical electrodynamics is found by developing a procedure which can be used to derive completely gauge-invariant models. The procedure involves building the most general Lagrangian for a particular order of derivatives (N) and a rank of tensor potential (M), then solving such that the model is completely gauge-invariant (the Lagrangian density, equation of motion and energy–momentum tensor are all gauge-invariant). In the case of N=1 order of derivatives and M=1 rank of tensor potential, electrodynamics is uniquely derived from the procedure. In the case of N=2 order of derivatives and M=2 rank of symmetric tensor potential, linearized Gauss–Bonnet gravity is uniquely derived from the procedure. The natural outcome of the models for classical electrodynamics and linearized Gauss–Bonnet gravity from a common set of rules provides an interesting connection between two well-explored physical models.

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