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(SUMMARIES)

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CONSTRAINT RELATION IN TWO-TENSOR GRAVITY

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An investigation is made into the question of the internal consistency and the nature of constraint in Salam's two-tensor theory of gravity. From general consideration of the invariance of that part of the action describing the interaction of the f and g tensors under general co-ordinate transformations, one finds that the field equations for the two tensors contain four identities, that if a set of differential constraints arise from one set of the equation, a second set is identically satisfied.

Although it is satisfying to know that just the correct number of identities exist to maintain co-ordinate invariance of the coupled theory, the general considerations do not enable one to recognize the gauge variables or the constraints themselves. We thus make a $3 + 1$ dimensional decomposition of the two-tensor theory. It is found that the invariance roles of the two tensors are very symmetric, so that the massiveness or masslessness of the fields is ambiguous. Constrained equations are obtained by elimination of gauge variables. We find that the form of the constraints casts doubt on the sign of the total energy of the theory. Finally we note that because of the non-linearity of the theory an extra degree of freedom arises.