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Curvature, vacuum energy and the quantization of gravity MAX CHAVES — On technical grounds pertaining the quantization of gravity we argue for the convenience of taking the metric and the connection to be independent. Then we point out that some important logical implications of this assumption have not previously been considered enough or at all. Among the latter is the existence of a second curvature tensor written, not in terms of the connection, but of the metric. The use of this term enables the construction of a Lagrangian that has a much a much more benign high energy limit than Einstein's theory, while at the same time is identical in the low-energy limit to that theory. In the high energy limit the Lagrangian becomes very similar to a Yang-Mills theory. Of course, the different behavior in these two widely separated limits requires the introduction of an energy scale. This very large scale is conveniently supplied by the vacuum energy of quantum fields. As a fringe benefit the vacuum energy from the quantum fields cancels out automatically no matter its value.

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