**Geometric Foundations of Gravity 2025** 



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## On the geometric origin of the energy-momentum improvement terms

I will show how the Belinfante-Rosenfeld improvement terms, that render the energy-momentum tensor symmetric, emerge by coupling the matter to the affine-connection. In this sense the improvement terms correspond to the hypermomentum of matter. I will show how this is realized in two standard examples, the Maxwell field and the Dirac field. I will also show how the connection-matter couplings can also result in a traceless energy tensor when the theory is invariant under frame rescalings, by revisiting the known example of a comformally invariant scalar field. Generalizations to higher derivative theories will also be discussed

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