

## AI Peer Review Challenge: Standard Model of Physics vs 4D GEM EOS

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**Abstract :** Natural evolution of ATP cognitive systems is to meet AI peer review standards. ATP process of axiom selection from Mizar to prove a conjecture would be further refined, as in all human and machine learning, by solving the real world problem of the proposed AI peer review challenge: Determine which conjecture forms the higher confidence level constructive proof between Standard Model of Physics SU(n) lattice gauge group operation vs. present non-standard 4D GEM EOS SU(n) lattice gauge group spatially extended operation in which the photon and electron are the first two trace angular momentum invariants of a gravitoelectromagnetic (GEM) energy momentum density tensor wavetrain integration spin-stress pressure-volume equation of state (EOS), initiated via 32 lines of Mathematica code. Resulting gravitoelectromagnetic spectrum ranges from compressive through rarefactive of the central cosmological constant vacuum energy density in units of pascals. Said self-adjoint group operation exclusively operates on the stress energy momentum tensor of the Einstein field equations, introducing quantization directly on the 4D spacetime level, essentially reformulating the Yang-Mills virtual superpositioned particle compounded lattice gauge groups quantization of the vacuum—into a single hyper-complex multi-valued GEM  $U(1) \times SU(1,3)$  lattice gauge group Planck spacetime mesh quantization of the vacuum. Thus the Mizar corpus already contains all of the axioms required for relevant DeepMath premise selection and unambiguous formal natural language parsing in context deep learning.

**Keywords :** automated theorem proving, constructive quantum field theory, information theory, neural networks

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