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*Regge's Einstein-Hilbert functional on the double tetrahedron.*

The double tetrahedron is the triangulation of the three-sphere gotten by gluing together two congruent tetrahedra along their boundaries. As a piecewise flat manifold, its geometry is determined by its six edge lengths, giving a notion of a metric on the double tetrahedron. Notions of Einstein metrics, constant scalar curvature metrics, and the Yamabe problem on the double tetrahedron will be discussed. The main tool is analysis of Regge's Einstein-Hilbert functional, a piecewise flat analogue of the Einstein-Hilbert (or total scalar curvature) functional on Riemannian manifolds. The behavior of the Einstein-Hilbert- Regge functional on the space of metrics and on discrete conformal classes of metrics will also be described. (Received August 15, 2010)