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# The Energy-Momentum tensor on low dimensional $S^2$ manifolds

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On a compact surface endowed with any  $S^2$  structure, we give a formula involving the Energy-Momentum tensor in terms of geometric quantities. A new proof of a B<sup>a</sup>-type inequality for the eigenvalues of the Dirac operator is given. The round sphere  $S^2$  with its canonical  $S^2$  structure satisfies the limiting case. Finally, we give a spinorial characterization of immersed surfaces in  $S^2 \times R$  by solutions of the generalized Killing spinor equation associated with the induced  $S^2$  structure on  $S^2 \times R$

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