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**Roger Zierau\*** (zierau@math.okstate.edu), Mathematics Department, Oklahoma State University, Stillwater, OK 74078, and **Leticia Barchini**, Mathematics Department, Oklahoma State University, Stillwater, OK 74078. *Square integrable harmonic spinors*. Preliminary report.

We consider the cubic Dirac operator on a reductive homogeneous space  $G/H$ . The space of harmonic spinors is the kernel. A space of square integrable harmonic spinors is defined. Since a homogeneous bundle on  $G/H$  typically has an indefinite invariant metric, square integrability necessarily is in terms of a noninvariant inner product. We describe this, and how a  $G$ -invariant hermitian form is defined on the  $L_2$ -space. A theorem will be stated that gives a condition for the  $L_2$  space of harmonic spinors to be nonzero. (Received September 20, 2010)