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The scalar bispectral problem of Duistermaat and Grunbaum asks for classifying ordinary differential operators whose family of eigenfunctions are also eigenfunctions in the spectral parameter. It originated from applications to tomography and time-band limiting, but was later related to various problems in representation theory, integrable systems and algebraic geometry. We will present a classification of the bispectral operators with values in an arbitrary finite dimensional algebra for operators (which in a certain technical sense) are of rank 1. This associates a Wilson type adelic Grassmannian (an algebraic ind variety) to every finite dimensional algebra  $R$ , which is the moduli space of  $R$ -valued bispectral operators. (Received September 16, 2016)