K-Theories for Certain Infinite Rank Bundles

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Several authors have recently constructed characteristic classes for classes of infinite rank vector bundles appearing in topology and physics. These include the tangent bundle to the space of maps between closed manifolds, the infinite rank bundles in the families index theorem, and bundles with pseudodifferential operators as structure group. In this paper, we construct the corresponding K-theories for these types of bundles. We develop the formalism of these theories and use their Chern character to detect a large class of nontrivial elements.

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