Daniel Hernandez Ruiperez (Salamanca) Moduli spaces of sheaves on degenerations of elliptic curves

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We nd some equivalences of the derived category of coherent sheaves on a Gorenstein genus one curve that preserve the (semi)-stability of pure dimensional sheaves. Using them we establish new identications between certain Simpson moduli spaces of semistable sheaves on the curve. For rank zero, the moduli spaces are symmetric powers of the curve whilst for positive rank there are only a nite number of non-isomorphic spaces. We prove similar results for the relative semistable moduli spaces on an arbitrary genus one bration with no conditions either on the base or on the total space. For a cycle of projective lines, we compute all the stable sheaves of degree 0. Finally, we prove that the connected component of the moduli space that contains vector bundles of rank r is isomorphic to the r-th symmetric product of the rational curve with one node.