1042-14-57   **Paul Hacking*** (`hacking@math.washington.edu`), Univ. of Washington, Dept. of Mathematics, Box 354350, Seattle, WA 98195. *Exceptional bundles associated to degenerations of surfaces.*

If a smooth complex surface X degenerates to a singular surface Y with a ordinary double point $x^2 + y^2 + z^2 = 0$, then the specialisation map $H_2(X, \mathbb{Z}) \to H_2(Y, \mathbb{Z})$ has nontrivial kernel, generated by the so called vanishing cycle: a 2-sphere in X which collapses to a point in Y. However, in the theory of families of surfaces, more complicated degenerations naturally occur which have no vanishing cycles. In some of these cases we construct an exceptional vector bundle on the smooth fibre X which (roughly speaking) is trivialised on Y, and so is analogous to a vanishing cycle. Here an *exceptional vector bundle* is a (holomorphic) complex vector bundle which is rigid (cannot be deformed) and satisfies some additional properties. They have previously been used to describe derived categories of algebraic varieties. (Received August 05, 2008)