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**Adam Nyman\*** ([nymana@mso.umt.edu](mailto:nymana@mso.umt.edu)), Math Building, University of Montana, Missoula, MT 59812, and **S. Paul Smith** ([smith@math.washington.edu](mailto:smith@math.washington.edu)), Department of Mathematics, University of Washington, Box 354350, Seattle, WA 98195. *Watts Theorem for Schemes.*

We describe obstructions to a direct-limit preserving right-exact functor between categories of quasi-coherent sheaves on schemes being isomorphic to tensoring with a bimodule. When the domain scheme is affine, all obstructions vanish and we recover Watts Theorem. We use our description of these obstructions to prove that if a direct-limit preserving right-exact functor  $F$  from a smooth curve is exact on vector bundles, then it is isomorphic to tensoring with a bimodule. This result is used to prove that the noncommutative Hirzebruch surfaces constructed by Ingalls and Patrick are noncommutative  $\mathbb{P}^1$ -bundles in the sense of Van den Bergh. We conclude by giving necessary and sufficient conditions under which a direct-limit and coherence preserving right-exact functor from  $\mathbb{P}^1$  to  $\mathbb{P}^0$  is an extension of tensoring with a bimodule by a sum of cohomologies. (Received September 12, 2007)