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**C-Y Jean Chan** and **Christine K Cumming\*** (cumming@ulm.edu), Department of Mathematics and Physics, 700 University Ave., Monroe, LA 71209, and **Huy Tai Ha**. *When are multigraded modules Cohen-Macaulay?*

Let  $M$  a finitely  $\mathbb{Z}^r$ -graded module over a standard  $\mathbb{N}^r$ -graded algebra over a local ring. We characterize the Cohen-Macaulayness of  $M$  in terms of the vanishing of specific sheaf cohomology modules. Next, we apply our result to study when multi-Rees modules are Cohen-Macaulay, extending previous studies on the Cohen-Macaulayness of multi-Rees algebras. (Received August 21, 2009)