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**Michael Brown, Claudia Miller\*** (clamille@syr.edu), **Peder Thompson** and **Mark Walker**. *Adams operations for matrix factorizations and a conjecture of H. Dao.*

Using an idea of Atiyah from 1966, we develop Adams operations on the Grothendieck groups of perfect complexes with support and of matrix factorizations using cyclic group actions on tensor powers. In the former setting, Gillet and Soule developed these using the Dold-Kan correspondence and used them to solve Serre's Vanishing Conjecture in mixed characteristic (also proved independently by P. Roberts using localized Chern characters). Their approach cannot be used in the setting of matrix factorizations, so we use Atiyah's approach. In addition, for their  $p$ -th operation they require  $p!$  to be invertible in the ground ring, whereas the cyclic approach only requires  $p$  to be invertible, which is more conducive to proofs in mixed characteristic. Lastly, the cyclic approach gives inherently simpler operations as it avoids the messy simplicialization step.

As an application, we prove a conjecture of H. Dao on the vanishing of Hochster's theta function for pairs of modules over an isolated hypersurface singularity in the remaining open case of mixed characteristic. Our proof is analogous to that of Gillet and Soule for the vanishing of Serre's intersection multiplicity. (Received August 09, 2015)