COMPUTING HECKE EIGENVALUES BELOW THE COHOMOLOGICAL DIMENSION

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ABSTRACT. Let Γ be a torsion-free finite-index subgroup of $\mathrm{SL}_n(\mathbb{Z})$ or $\mathrm{GL}_n(\mathbb{Z})$, and let ν be the cohomological dimension of Γ. We present an algorithm to compute the eigenvalues of the Hecke operators on $H^{\nu-1}(\Gamma;\mathbb{Z})$, for $n = 2, 3$, and 4. In addition, we describe a modification of the modular symbol algorithm of Ash and Rudolph for computing Hecke eigenvalues on $H^{\nu}(\Gamma;\mathbb{Z})$.