1035-11-791 **Jerome William Hoffman*** (hoffman@math.lsu.edu), Department of Mathematics, LSU, Baton Rouge, LA 70803, and **Helena Verrill** (verrill@math.lsu.edu), Department of Mathematics, LSU, Baton Rouge, LA 70803. *L-functions and l-adic representations for noncongruence subgroups.*

Let $S_k(\Gamma)$ be the space of weight k cusp forms for a subgroup $\Gamma \subset \mathrm{SL}(2, \mathbb{Z})$. When Γ is a congruence subgroup, Deligne constructed a compatible system of l-adic representations ρ_l associated to this space. The L-function of this, $L(s, \rho_l)$, is expressible as a product of L-functions $L(s, f_j)$ for newforms f_j attached to congruence subgroups of $\mathrm{SL}(2, \mathbb{Z})$. A. J. Scholl constructed analogous representations for Γ an arbitrary, not necessarily congruence, subgroup. Their properties are strikingly different from the congruence case. Nonetheless, these representations are motivic, and general philosophy predicts they are automorphic, but now possibly for reductive groups other than $\mathrm{GL}(2)_{/\mathbb{Q}}$. We give new examples where this automorphic property can be proved, or at least experimental evidence for it. The weight $k = 3$ and the examples show that $L(s, \rho_l)$ is a product of L-functions for classical newforms, with base-extension and twist by Hecke characters. We discuss general conjectures relating these to automorphic representations for orthogonal groups in four variables. (Received September 15, 2007)