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Kaneenika Sinha* (kansinha@math.ualberta.ca), Dept of Mathematics, University of Alberta, Edmonton, AB T6G2G1, Canada. *Vertical Sato-Tate Conjecture.*

In 1997, Serre proved the following vertical variant of the Sato-Tate conjecture : if p is a fixed prime, then the eigenvalues of the p -th Hecke operator acting on the spaces $S(N, k)$ of cusp forms of weight k and level N are equidistributed with respect to a certain measure as we vary k and N . In this talk, we make Serre's equidistribution effective, that is, we find out explicit error terms and constants. This is done with a careful investigation of the Eichler-Selberg trace formula combined with some interesting trigonometric polynomials due to Selberg-Beurling-Vaaler. We will apply this to study the factorization of Jacobian of $X_0(N)$ into simple Abelian varieties. (This is joint work with Ram Murty) (Received July 31, 2008)