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**Jack Polynomials, Exclusion Statistics, and non-Abelian FQHE States at  $\nu = k/(km+r)$** <sup>1</sup> F. D. M. HALDANE, B. ANDREI BERNEVIG, Princeton University — We describe a general family of non-Abelian FQHE states at  $\nu = k/(km+r)$  with polynomial wavefunctions  $\prod_{i<j}(z_i - z_j)^m J_\lambda^\alpha(z_1, \dots, z_N)$  where  $J_\lambda^\alpha$  is a symmetric Jack polynomial with negative (coprime) rational parameter  $\alpha = -(k+1)/(r-1)$ , and  $\lambda$  is the “most compressed” “ $(k, r, N)$ -admissible” partition. These polynomials are dominated by an occupation-number pattern maximally-obeying the generalized Pauli rule that no (consecutive) group of  $(km+r)$  orbitals contains more than  $k$  particles and ( $m > 0$ ) no group of  $m$  orbitals contains more than one. This exclusion rule defines a space of polynomials characterized by how they vanish as clusters of particle coordinates contract to a point. The edge of these FQHE states has a fractionally-quantized thermal Hall effect with  $c^{\text{eff}} = k(r+1)/(k+r)$ , derived from the exclusion rule. The  $r = 2$  family are the Laughlin, Moore-Read, and Read-Rezayi states, related to unitary conformal field theories. The  $r > 2$  families are related to non-unitary  $W_k^{k+1, k+r}$  cft, but (as polynomials) have well-defined quasi-hole propagators, which overcomes the principal objection to the proposition that non-unitary cft’s can describe FQHE states. The  $m = 1, r = k+1$  set are a non-Abelian alternative construction of states at  $2/5, 3/7, 4/9, \dots$

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