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The beginning of this study is the observation that several classical approximation operators can be interpreted by means of symmetric Schur function or equivalently unitary group character identities. For instance, Bernstein polynomials arise from the dual Cauchy identity. In this talk, we describe the analogue of Bernstein polynomials based on symplectic group characters or equivalently symplectic Schur functions. These same polynomials arose already in V. Jones' first work on subfactors and braid invariants. We show that these polynomials share some of the fundamental properties of the standard Bernstein approximations: (1) uniform convergence, (2) variation-diminishing property (shape preserving), (3) conditions for monotone convergence. The initial question of pointwise convergence can be attacked by means of the asymptotic character formula for the classical groups, which was developed by Vershik and Kerov, Boyer, and Okounkov and Olshanski. The study of approximation operators will require refinements of these ideas. (Received September 26, 2000)