1056-14-1126 **Jim Carrell***, Department of Mathematics, University of British Columbia, Vancouver,, BC V6T 1Z2. *On a remarkable formula of Kostant and Macdonald, pattern avoidance and smoothness of Schubert varieties in ageneralized flag variety.*

A remarkable formula due to Bert Kostant and Ian Macdonald relates the exponents of a semisimple complex algebraic group G to the number of positive roots of height i for each i between 1 and the height of the highest root. The purpose of this talk is to recall this formula and revisit a generalization to smooth Schubert varieties in the flag variety G/B of G due to the author and E. Akyildiz (Proc. Nat. Acad. Sci. U.S.A. 86 (1989), 3934–3937). This turns out suggest an extremely simple algebraic citerion for smoothness of a rationally smooth Schubert variety: namely, as long as G doesn't contain any G_2 factors, then a rationally smooth Schubert variety X in G/B is smooth if and only if the dimension of the linear span of the reduced tangent cone to X at the identity coset equals the dimension of X. (Received September 21, 2009)