

Stability Analysis of a Beam Loaded Double r.f. System, S. KOSCIELNIAK, TRIUMF, Vancouver, Canada - The CERN PS Booster uses a double r.f. system (5th and 10th harmonics) to lengthen the bunches and reduce the transverse space-charge tune shift. We present stability criteria for such a system under conditions of strong beam loading. The condition that all normal modes be exponentially damped, places constraints on the coefficients of the system characteristic polynomial developed in the Laplace frequency variable. For a sextic polynomial, as occurs with a double r.f. system, interacting with a single beam mode and no feedbacks, there are 7 Routh conditions and these are elucidated and interpreted in this paper.