

Tuning Control and Transient Response of the ARES, K. AKAI, N. AKASAKA, E. EZURA, T. KAGEYAMA, H. MIZUNO, F. NAITO, H. NAKANISHI, Y. TAKEUCHI, Y. YAMAZAKI, KEK; T. KOBAYASHI, Institute of Applied Physics, Tsukuba Univ. - The accelerator resonantly coupled with an energy storage (ARES) is expected to be a solution to problems concerning the coupled bunch instability due to the accelerating mode in large storage rings with an extremely high luminosity. The principle of the ARES has been studied extensively, and the results are promising. However, we still must be careful on RF control and operation issues, since the ARES is going to be operated under such a condition that the accelerating cavity is resonantly coupled with a high-Q ($\gg 10^5$) energy storage cavity via a low-Q ($\gg 10^2$) coupling cavity in between. For example, an error in tuning control system can increase not only the generator power but the power extracted via the damper at the coupling cavity. The latter can degrade the Q-value of the total system and even damage the load terminating the damper. In the present paper, several methods of the tuning control system are examined with tolerances for errors taken into account. The most promising tuning control method is proposed. In addition, transient response of the ARES to an ion clearing gap is discussed.