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A 1-2 GHz stochastic cooling system for antiprotons and rare isotopes

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A 1–2 GHz stochastic cooling system is being de-veloped to provide fast 3D cooling of hot secondary beams (antiprotons at 3 GeV and rare isotope ions at 740 MeV/u) at intensities up to 10^8 particles per cycle. For antiproton cooling, cryogenic plunging pick-up electrodes will be used to improve the ratio of Schott-ky signals to thermal noise. To cool hot rare isotope beams quickly, a two-stage cooling (pre-cooling by the Palmer method and main cooling by the notch-filter method) has been decided. This paper presents the recent R&D highlights of this unique stochastic cool-ing system especially the main sub-systems i.e. two cryogenic plunging slotline pick-ups, one Palmer pick-up, and two slot-ring kickers.

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