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【808】 Laser cooling of C_2^- in a digital RF trap for sympathetic cooling of antiprotons

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C_2^- and other anionic molecules produced in an electric discharge in an Even-Lavie valve are accelerated to 1.8 keV in a pulsed electric field; the C_2^- is then mass selected in a Wien filter. Subsequent deceleration in the static electric field of a resistive tube with a potential difference of 1.8 kV reduces the energy of the particles to a trappable range. A digital RF trap on the same 1.8 kV potential stores the C_2^- molecules for subsequent experimentation with cooling lasers. A successful cooling of anionic C_2^- would open up novel experiments based on sympathetic cooling of antiprotons and other anionic systems to sub-Kelvin temperatures.

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