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**Pulsed Counter-Rotating Source of Slow, Cold Molecules** IGOR LYUKSYUTOV, LES SHEFFIELD, MARK HICKEY, VITALIY KRASOVITSKIY, DAYA RATHNAYAKA, Department of Physics and Astronomy, Texas A&M University, DUDLEY HERSCHBACH, Department of Chemistry and Chemical Biology, Harvard University — We describe the performance of a new design of the counter-rotating source (CRS) of slow molecules introduced originally by Gupta and Herschbach. The CRS produces a supersonic expansion from a nozzle near the tip of a hollow rotor spun at high speed contrary to the exit beam velocity. Thereby the lab velocity can be markedly reduced. Introducing a pulsed feeding system, cryo-cooling, and shutter system has eliminated the main problem of the original CRS apparatus, in which continuous gas flow imposed high background pressure. The new version provides intense pulses, typically of duration 0.1 ms with lab speeds as low as 40 m/s and longitudinal temperature as low as 0.5 K. This device can, in principle, decelerate (or accelerate) any molecule available as a gas; we report experiments producing slow beams of krypton, oxygen, ammonia, and nitrogen dioxide.

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