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Stellingen

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Traveling-wave Stark deceleration of SrF molecules

Joost Elbert van den Berg

1. Increasing the voltage on the electrodes from 5 kV to 8 kV increases the 1D-acceptance of the traveling-wave Stark deceleration process for SrF molecules in the (2,0)-rotational state by almost three orders of magnitude, while the acceptance for the guiding process is only doubled. (*Chapter 3*)
2. The heavy alkaline-earth monohalide molecules form a group of excellent candidates for fundamental physics studies: they can be Stark decelerated, laser cooled, and are sensitive probes for physics beyond the Standard Model of particle physics.
3. A modular traveling-wave Stark decelerator is a versatile device that enables fully stopping beams of heavy molecules, including complex molecules such as benzonitrile. (*Chapter 3*)
4. The combination of traveling-wave Stark deceleration and laser cooling can produce more cold SrF molecules per second than the present state-of-the-art experiments that use only laser slowing and cooling. (*Chapter 6*)
5. The close proximity of a good mechanical workshop and the availability of technical support are essential for conducting state-of-the-art molecular beam deceleration experiments.
6. Although the noise of high-voltage amplifiers is a nuisance to the experimenters, hearing them go silent unexpectedly does not mean relief but heralds worse problems.
7. During construction of an experimental setup, gravity is often experienced as the most adverse of the four fundamental forces of nature.
8. The fact that Dutch high school students can suddenly become enthusiastic about physics during a three day commercial training for their final exams, shows that there are many missed opportunities in the educational system.