



Solid State Institute
המכון למצב מוצק

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סמינר

Degenerate Raman sideband cooling of 40K atoms

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Abstract

Ultracold atoms experiments require several cooling stages before the gas can be used for the intended purpose. Sub-recoil laser cooling techniques are relatively fast, incurring small losses and leaving the atoms at a specific internal state. In this lecture, I will present the first implementation with fermionic potassium 40 atoms of a technique called degenerate Raman sideband cooling. In this technique, Raman transitions, driven by a confining 3D lattice, remove vibrational energy. Optical pumping light closes the cooling cycle. In the experiment, we achieve temperatures as low as 1 μ K while spin polarizing the sample. I will present the experimental apparatus, including the laser systems built for this purpose. Finally, I will discuss the dependence of the cooling scheme on various parameters, such as the Raman detuning, duration, and the applied magnetic field.

ההרצאה תתקיים ביום רביעי, ה-27.7.22 בשעה 12:30
באודיטוריום המכון למצב מוצק, קומת כניסה

**The lecture will take place on Wednesday, 27.7.22 at 12:30
at the Solid State Institute auditorium, entrance floor**

<https://technion.zoom.us/j/94516920602>

M.Sc. Student of Associate Professor Yoav Sagi