



Solid State Institute
המכון למצב מוצק

TECHNION
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הטכניון
מכון טכנולוגי
לישראל

SPECIAL SEMINAR

סמינר מיוחד

Towards a measurement of parity violation in chiral molecular ions: The advantage of using a mixed handedness sample

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Abstract

Unlike other interactions in the Standard Model, the weak force is asymmetric under parity transformation. The two hands of a chiral molecule, known as enantiomers, are identical up to a parity transformation and thus provide a promising probe for parity violation (PV) effects like different transition frequencies for each enantiomer. However, despite the ongoing efforts, PV has not yet been observed in molecules where one of the challenges is isolating samples of single-handed chiral molecules.

Here we introduce a scheme [1] to perform Ramsey spectroscopy on a racemic mixture of chiral molecules, simultaneously extracting the transition frequencies for both hands and isolating the PV shift. Our scheme not only overcomes the need for single-handedness, but also benefits from common mode noise rejection of several systematics which is crucial for precision measurements. Lastly, I will discuss our progress towards the measurement and our plan to implement the scheme on trapped molecular ions.

[1] I. Erez, E.R. Wallach, Y. Shagam - arXiv:2206.03699 (2022)

ההרצאה תתקיים **ביום חמישי, ה-8.12.2022 בשעה 12:00**

באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on **Thursday, 8.12.2022 at 12:00**
at the Solid State Institute auditorium, entrance floor

M.Sc. Student of Assistant Professor Yuval Shagam
and Assistant Professor Yotam Soreq