



Cold Atom Molecule Interactions (CATMIN)

13 – 15 de jul. de 2022

Perimeter Institute for Theoretical Physics

Fuso horário America/Toronto

 Digite o seu termo de pesquisa


Visão Geral

Tabela de Horários

Lista de Contribuição

Registro

Speaker List

Lista de participantes

 COVID Protocols While
Visiting Perimeter Institute

 Respectful Environment
Code of Conduct

 Computer Requirements for
Virtual Participation

 Accessibility at Perimeter
Institute

 Ground Transportation to
Perimeter

Hotels

Stephanie Mohl

smohl@perimeterinstitut...

Observation of linewidth narrowing in EIT polarization spectroscopy involving hot Rydberg atoms with Laguerre Gaussian modes

14 de jul. de 2022 14:00

20m

Theatre (Perimeter Institute for Theoretical Physics)

Palestrante

Luis Marcassa (University of Sao P...

Descrição

Naomy Duarte Gomes¹, Barbara da Fonseca Magnani¹, Jorge Douglas Massayuki Kondo², Luis Gustavo Marcassa¹¹ Instituto de Física de Sao Carlos, Universidade de Sao Paulo² Departamento de Física, Universidade Federal de Santa Catarina

In this work, we investigate the narrowing of the electromagnetically induced transparency (EIT) profile in a three-level ladder of rubidium atoms at room temperature using a Rydberg state and a Laguerre-Gaussian mode laser. The Gaussian probe field couples the $5S_{1/2} \rightarrow 5P_{3/2}$ states. The control field, which can be in either Gaussian or Laguerre-Gaussian (LG) modes, couples the $5P_{3/2} \rightarrow 4D$ state. The EIT spectrum is measured with the polarization spectroscopy (PS) technique, resulting in a dispersive signal. The dispersive PS EIT linewidth is 20% narrower for the LG mode than for a Gaussian mode, due to the donut spatial distribution of the LG mode used. We have implemented a probe transmission model using a simplified Lindblad master equation, which allows us to calculate the PS signal and reproduces well the experimental results. The use of the PS signal eliminates the need to fit a curve when measuring EIT linewidths while still providing subnatural widths. Narrowing the transmission profile is of great interest to measure effects such as atomic collisions and microwave fields.

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🔗 Materiais de apresentação

Ainda não há materiais

Referências externas

22070009 48f99c2d-3623-46a3-8d40-100d13fd40ca 76365cbe-4ead-4c0d-bd49-bec8324924fb