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Contribution ID: **124** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Scattering and Reaction Calculations for the 8Be Composite System

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We apply the no-core shell model with continuum technique to investigate nuclear reactions involving p+7Li and n+7Be with 8Be as the composite system. This method enables accurate description of both bound states and the continuum using chiral nucleon-nucleon and three-nucleon forces as input. We report phase-shifts, astrophysical S-factors and cross-sections for a suite of scattering and reaction processes.

The production and destruction of 7Li through these channels is the main contributor to the prediction of cosmological Lithium abundance of which current estimates differ significantly from measurements. Through first-principles calculations of 7Li(p, γ)8Be and 7Li(p, e+ e-)8Be capture, we also examine the nuclear processes relevant for the ATOMKI anomaly (which posits the existence of a new boson with a mass of 17 MeV).

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