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Uncertainties of the Solar Axion Flux Computation

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The calculation of the solar axion flux has recently generated much attention due to the upcoming helioscope IAXO, studies of plasmon processes, and in context of the Xenon1T anomaly. It has been realised that axions can be powerful tools for studying solar metal abundances and magnetic fields. However, the feasibility of such studies depends on our ability to accurately predict the solar axion flux. In this talk, I will present an overview of solar models and opacity codes and summarise the statistical and sytematic uncertainties associated with the solar axion flux calculation from Primakoff, ABC, and plasmon interactions. I will discuss how the calculations could be improved futher, e.g. by including electron degeneracy effects. As a direct application, IAXO's ability to distinguish KSVZ benchmark models will be analysed as well as its prospects to tackle the solar abundance problem. I will close with remarks on our study in the context of the ongoing work in the "axion landscape" and briefly report on ongoing research activities in this direction.

Speaker

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