Abstract Submitted
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Interference solutions in the ^{12}C(α,γ)^{16}O reaction[1] RICHARD DEBOER, R.E. AZUMA, UND and JINA, A. BEST, INFN, C.R. BRUNE, OU, J. GRRES, UND and JINA, S. JONES, HITS, M. PIGNATARI, UH, D. SAYRE, LLNL, K. SMITH, UTK, E. UBERSEDER, M. WIESCHER, UND and JINA — The reaction rate of ^{12}C(α,γ)^{16}O is critical in modeling the evolution of stars throughout the many stages of their lifecycles [1]. Yet despite its importance, a precise determination of the cross section remains elusive. This is largely because the cross section at stellar energies is over an off-resonance region, where it is determined by the delicate interference between several broad resonances. Complicating the situation, are the high energy tails of subthreshold levels whose properties are difficult to determine directly. These resonances can interfere in a complicated way that is often difficult to determine. In this presentation the different interference solutions for the $E1$ ground state [2], 6.05 MeV, and 6.13 MeV transitions [3,4] will be discussed by way of a phenomenological R-matrix analysis, addressing several questions raised in the literature. It will be shown how the data of [3] are in good agreement with both the asymptotic normalization coefficients determined by [4] and the data of [5], if systematic uncertainties are taken into consideration. [1] W.A. Fowler, Science, **226**, 4677 (1984) [2] M. Gai, ArXiv:1506.04501 (2015) [3] Matei et al. PRL **97**, 242503 (2006) [4] Avila *et al.* PRL **114**, 071101 (2015) [5] Schürmann *et al.* PLB **703**, 557 (2011)

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