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Experimental study of capture barrier distributions for ^{58}Ni+^{60}Ni[1] E. WILLIAMS, D.J. HINDE, M. DASGUPTA, I.P. CARTER, K.J. COOK, D.Y. JEUNG, D.H. LUONG, S.D. MCNEIL, C.S. PALSHETKAR, D.C. RAFFERTY, K. RAMACHANDRAN, C. SIMENEL, A. WAKHLE, Department of Nuclear Physics, The Australian National University, Canberra, ACT 0200 Australia — Current coupled channels (CC) models treat fusion as a coherent quantum-mechanical process, in which coupling between the collective states of the colliding nuclei influences fusion probability in near-barrier reactions. While CC models have been used to successfully describe many experimental barrier distribution (BD) measurements, the CC approach has failed in several key cases. The reason for these failures is poorly understood; however, it has been postulated that dissipative processes may play a role. Traditional fusion barrier distribution experiments can only probe the physics of fusion for collisions at the top of the Coulomb barrier ($L = 0\hbar$). In this work, we will present a novel method of probing dissipative processes within the Coulomb barrier by exploiting the predicted sharp onset of fission at $L \sim 60\hbar$ for reactions forming compound nuclei with $A < 160$. Using the ANU's 14UD tandem accelerator and CUBE spectrometer, fission outcomes have been measured for the ^{58}Ni+^{60}Ni reaction at a wide range of energies, in order to measure a fission BD. First results will be presented in the context of complementary fusion BD measurements.

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