FOUR-BODY TREATMENT OF INCLUSIVE BREAKUP OF BORROMEAN NUCLEI

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We derive an expression for the inclusive breakup cross section of Borromean nuclei within a four-body model. The observed particle is treated as a spectator. The cross section is found to be similar in structure to that of two-fragment projectiles as discussed by Austern et al. (Austern N. et al. Phys. Rep. 154, 125 (1987)), and is proportional to matrix element with a source function $\hat{\rho}_{x_1,x_2} = (\chi^{(-)}_{b,DWBA}|\Psi^{(+)}_{4B} >$ where b is the observed fragment, and x_1 and x_2 are the interacting fragments (in e.g., ^{6}He = $\alpha + n + n$, b is α and x_1 and x_2 correspond to the neutrons). The DWBA + corrections version of the theory is obtained using the Faddeev-Yakubovski equations representing the four-body wave function $|\Psi^{(+)}_{4B} >$. The Faddeev approach to the inclusive breakup of two-fragment projectile of Hussein et al. (Hussein M.S., Frederico T., and Mastroleo R.C., Nucl. Phys. A, 511, 269 (1990)) is used as a guide. Application of the theory to the spectrum of α's in the ^{6}He + ^{208}Pb $\rightarrow \alpha$ + (n + n +^{208}Pb) reaction is presented.