In medium energy levels of light cluster

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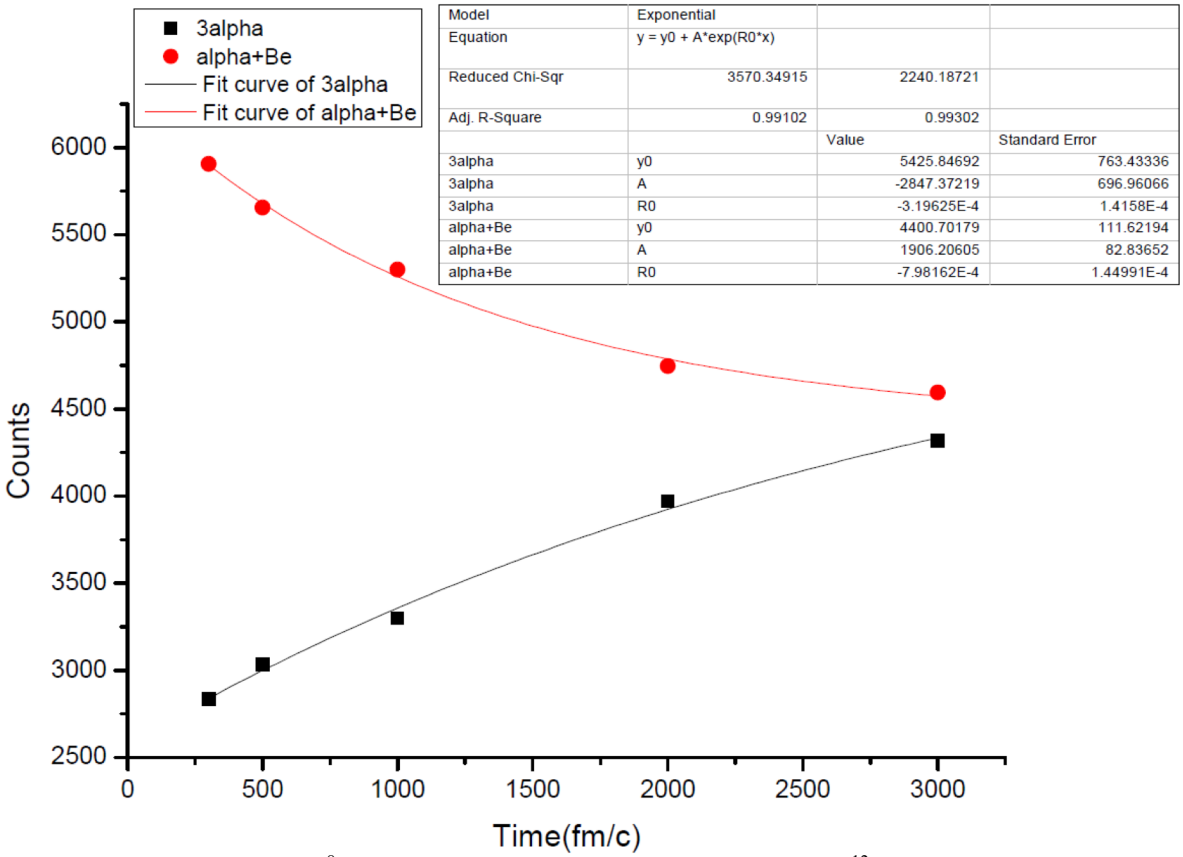
We explore the possibility of deriving energy levels of nuclei from fragmentation reaction. In particular, we investigate the geometry configurations of triple α, t+2p and ^{3}He+2p resonances measured in ^{70}Zn+^{70} Zn, ^{64}Zn+^{64}Zn and ^{64}Ni+^{64}Ni at 35 MeV/nucleon using the hyper-spherical method. The experimental results are successful compared to microscopic CoMD calculations. In particular the model calculations show that 3α particle correlation functions are mostly determined by direct 3α and α+^{8}Be production in the fragmentation reaction with the contribution from ^{12}C decay negligible. We derive the three-body correlation function from the knowledge of the one-body and two-body correlations. The rate of α+^{8}Be→^{12}C reaction is studied as well. The possibility of Bose Einstein Condensate/Fermion Quenching is addressed.



Model	Exponential		
Equation	y = y0 + A*exp(R0*x)		
Reduced Chi-Sqr	3570.34915	2240.18721	
Adj. R-Square	0.99102	0.99302	
		Value	Standard Error
3alpha	y0	5425.84692	763.43336
3alpha	A	-2847.37219	696.96066
3alpha	R0	-3.19625E-4	1.4158E-4
alpha+Be	y0	4400.70179	111.62194
alpha+Be	A	1906.20605	82.83652
alpha+Be	R0	-7.98162E-4	1.44991E-4

FIG. 1. Number of 3α and α+^{8}Be production vs time in the CoMD approach. ^{12}C production is negligible as compared to these channels.