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[P13] Semi-empirical nuclear fission yield model for astronomical use based on the four-dimensional Langevin approach

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Nuclear fission plays an essential role in nuclear reactors and the r-process nucleosynthesis, which produces heavy elements like gold and uranium via the fission recycling process. Fission fragments of superheavy nuclei can be the seed nuclei of the r-process. However, there has been considerable ambiguity among theoretical predictions for the fission yields of superheavy nuclei. For a more precise evaluation of the fission contribution to the r-process, we have developed a semi-empirical fission yield model by fitting the results of our four-dimensional Langevin model with six Gaussians. Our Langevin model can reproduce both fission fragment mass distributions and the total kinetic energy very well. We performed the Langevin calculations for nuclei with Z=92-122 from neutron-deficient side to neutron-rich side. In our semi-empirical model, we provide a fission fragment mass distribution Y(Z, A) with the combination of the six Gaussians Y(A) described above, and normalized Gaussian distribution for Y(Z) on each Y(A) evaluated by the abundant experimental data of actinides[1]. This poster will mainly show the parameter study of the six Gaussians fitted by the Langevin calculations.

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