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Exotic radioactive beams production using fusion-fission reactions OLEG TARASOV, A.M. AMTHOR, D. BAZIN, W. MITTIG, D.J. MORRISSEY, J. PEREIRA, B.M. SHERRILL, A.C.C. VILLARI, Michigan State Univ, O. DELAUNE, F. FARGET, B. BASTIN, L. CACERES, O. KAMALOU, M.G. SAINT-LAURENT, H. SAVAJOLS, C. STODEL, J.C. THOMAS, GANIL, France, B. BLANK, S. GREVY, CENBG, France, S.M. LUKYANOV, JINR, Dubna, L. PERROT, IPN, France — Fusion-Fission reaction products produced by a 238U beam at 24 MeV/u on Be and C targets were measured in inverse kinematics by use of the LISE fragment separator. The identification of fragments was done using the dE-TKE-Brho-ToF method. Germanium gamma-detectors were placed in the focal plane near the Si stopping telescope to provide an independent verification of the isotope identification via isomer tagging. The experiment demonstrated excellent resolution, in Z, A, and q. The results demonstrate that a fragment separator can be used to produce radioactive beams using fusion-fission reactions in inverse kinematics, and further that in-flight fusion-fission can become a useful production method to identify new neutron-rich isotopes, investigate their properties and study production mechanisms. Mass, atomic number and charge-state distributions are reported for the two reactions. The comparison of the experimental atomic-number and mass distributions combined with the analysis of the isotopic-distributions properties show that between the 9Be and the 12C target, the reaction mechanism changes substantially, evolving from a complete fusion-fission reaction to incomplete fusion or fast fission.

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