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Strong orientation dependence of multinucleon transfer processes in ^{238}U+^{124}Sn reaction KAZUYUKI SEKIZAWA, Graduate School of Pure and Applied Sciences, University of Tsukuba, KAZUHIRO YABANA, Center for Computational Sciences, University of Tsukuba — We investigate multinucleon transfer (MNT) processes induced by a prolately deformed ^{238}U nuclei. Experimentally, substantial cross sections of MNT processes accompanying more than ten protons have been measured in ^{238}U+^{124}Sn reaction at energies around the Coulomb barrier. We have investigated this reaction employing a microscopic framework of the time-dependent Hartree-Fock (TDHF) theory. From the calculation, we have found that the amount of transferred nucleons depends much on the relative orientation between the deformed axis of ^{238}U and the relative vector connecting centers of ^{238}U and ^{124}Sn nuclei. When the ^{238}U collides from its tip with ^{124}Sn, a formation of thick neck is observed. However, when ^{238}U collides from its side, the neck formation is substantially suppressed. We have found that a large amount of protons is transferred in the tip collision. This is caused by the breaking and absorption of the neck which is composed of both protons and neutrons. In the side collision, we have not observed large probability of MNT due to the suppressed neck formation. We thus consider that the measured MNT processes involving about a tens of protons originate from the neck breaking dynamics following the tip collision of deformed ^{238}U nucleus.

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