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Title: Neuro-fuzzy modeling of deformation parameters for fusion-barriers

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Abstract: The fusion-barrier distribution is very sensitive to the structure of the colliding nuclei such as nuclear quadrupole and hexadecapole deformation parameters and their signs. If the nuclei that enter the fusion reaction are deformed, the barrier problem becomes complicated. Therefore the deformation parameters are taken into account in the calculations. In this study, Neuro-Fuzzy approach, ANFIS, method has been used for the estimation of ground-state quadrupole ($\epsilon(2)$) and hexadecapole ($\epsilon(4)$) deformation parameters for the nuclei. According to the results, the method is suitable for this task and one can confidently use it to obtain the data that is not available in the literature. (C) 2020 Korean Nuclear Society, Published by Elsevier Korea LLC.

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