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# Enhanced monopole and dipole transitions in medium-heavy nuclei induced by alpha custer structures

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$\alpha$ cluster structures are well known to appear in excited states of lighter mass nuclei. According to recent studies, the isoscalar monopole (IS0) and dipole excitations (IS1) are considered to be important probes to identify the alpha cluster struture. We have calculated the continuum IS0 and IS1 transitions in the $^{44}$Ti = $\alpha$ + $^{40}$Ca system. We will demonstrate that the prominent enhancement will occur in the lower excitation energy than the single particle excitation energy due to the development of the alpha cluster structures. We have also extend the similar calculation to the much heavier systems, such as the Te isotopes with the $\alpha$ + Sn structure in the mass range from A=104 to A=110. From a series of our calculations, the systematic enhancement in the IS0 and IS1 strengths has been confirmed in the lower excitation energy of $E_x \leq 15$ MeV.

Furthermore, the dissociation strength of $^{135}$Cs into $\alpha$ + $^{131}$I, which is induced by the electric dipole (E1) field, will also be discussed. The $^{135}$Cs nucleus is a kind of long lived fission products (LLFPs) in nuclear wastes. From the viewpoint of the alpha cluster structure, there is a possibility that the low-lying E1 transition will be effective for the transmutation of $^{135}$Cs.

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