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Longitudinal Form Factor of Isoscalar Particle-Hole States in  $^{16}\text{O}$ ,  $^{12}\text{C}$  and  $^{40}\text{Ca}$  with M3Y Interaction

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**Abstract:** Longitudinal form factors of the low-lying,  $T = 0$ , particle-hole states of  $^{16}\text{O}$ ,  $^{12}\text{C}$  and  $^{40}\text{Ca}$  are studied in the framework of Random Phase Approximation RPA. The basis of single particle states is considered to include  $0s$ ,  $0p$ ,  $1s-0d$  and  $0f-1p$ . The Hamiltonian is diagonalized in the presence of Michigan three-rang Yakawa (M3Y) interaction and compared with our previous results depend on Modified Surface Delta Interaction MSDI interaction. Admixture of higher configuration up to  $2p-1f$  is considered for the ground state. Effective charges are used to account for the core polarization effect. Comparisons are made to experimental data where available and the theoretical significance of the calculation and its results is discussed.

**Key Words:** Longitudinal Form Factors, Random Phase Approximation (RPA), Collective Model, and M3Y

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