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RESONANCE PHENOMENA IN HEAVY NUCLEI COLLISIONS AND AC/DC STARK EFFECT IN SUPER STRONG LASER FIELD

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We present new approach for studying interaction of the finite Fermi systems (nuclei) with ansuperintense external fields (electric and laser fields). It is the combined relativistic operator perturbation theory (OPT) and relativistic energy formalism (REA). We present new results of AC Stark shifts of single proton states in the nuclei ^{16}O, ^{168}Er and compared these data with known results by Keitel et al. New data are also listed for the ^{57}Fe,^{171}Yb nuclei. Shifts of several keV are reached at intensities of roughly 10^{34} W/cm^2 for O and 10^{32} W/cm^2 for heavier nuclei. New unified approach (OPT+REA), based on the S-matrix Gell-Mann and Low formalism, is used for studying the electron-positron pair production in the heavy nuclei collisions and treating a compound nucleus in an extreme electric field. Heavy ions collisions near the Coulomb barrier are surrounded by existence of narrow e+ line in a positron spectra. The positron spectrum narrow peaks as a spectrum of the resonance states of compound super heavy nucleus are treated. The nuclear and electron subsystems are considered as two parts of system, interacting with each other through the model potential. The calculation results for cross-sections at different collision energies for ^{238}U+^{238}U, ^{232}Th+^{232}Th, ^{250}Cf+^{250}Cf pairs are presented.