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# Properties of charge recombination in liquid argon

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Liquid argon is an excellent medium for detecting particles, given its yields and transport properties of light and charge. The technology of liquid argon time projection chambers has reached its full maturity after four decades of continuous developments and is, or will be, used in world class experiments for neutrino and dark matter searches. The collection of ionization charge in these detectors allows to perform a complete tridimensional reconstruction of the tracks of charged particles, calorimetric measurements, particle identification. This work proposes a novel approach to the problem of charge recombination in liquid argon which moves from a microscopic model and is applied to the cases of low energy electrons, alpha particles and nuclear recoils. The model is able to describe precisely several sets of experimental data available in the literature, over wide ranges of electric field strengths and kinetic energies and can be easily extended to other particles.

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