Abstract. The hydrodynamic equations of positive and negative dust, Boltzmann electron and ion density distribution, and Poisson equation are used along with the reductive perturbation method to derive a cylindrical Kadomtsev-Petviashvili (CKP) equation. G'/G expansion method is used to obtain a new class of solutions. At certain condition, the solutions degenerate to solitary wave solutions. The effects of the physical parameters on the characteristics of solitary pulses are examined. The results give elucidation of the properties of dust acoustic solitary pulses in multicomponent space plasmas, particularly in interstellar dust clouds in a galactic disk and astrophysical plasma systems.