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HAMILTONIAN STRUCTURE OF THE CYLINDRICAL KORTEWEG-DE VRIES EQUATION FOR DUST ION ACOUSTIC WAVES IN UNMAGNETISED PLASMA

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By employing reduction perturbation technique (RPT), the cylindrical Korteweg-de Vries equation (cKdV) for dust ion acoustic waves in unmagnetised plasma is derived. Using Hamilton's variational principle, the expressions for Lagrangian densities of the cKdV fields are constructed. The expressions for Lagrangian densities can be used to construct the Hamiltonian densities which characterize the Zakaraov-Faddeev-Gardner equation.