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Schrödinger-Poisson model for the growth of cosmic structures

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The formation of structures in the universe is studied with the help of a dynamical cold dark matter model addressed as the Schrödinger-Poisson model. The Schrödinger-Poisson equation (SPE) is obtained from the Vlasov-Poisson equation which is derived in a perturbation regime of the fluid equations in the Newtonian regime. The SPE is restricted to one dimension and numerically integrated using a representation in a B-Splines basis and the Crank-Nicolson method, under the Magnus approximation, for the time propagation. Using different dark energy models we obtain the cold dark matter dynamics and the matter power spectrum. We discuss the effects of these models paying special attention to the comparison with the Λ-CDM model.

Author: LENIS TRUJILLO, Jeison Stiven (Universidad del Valle)

Co-authors: Dr VALENZUELA TOLEDO, CESAR ALONSO (Departamento de Física, Universidad del Valle); Dr MADROÑERO PABÓN, Javier (Centre for Bioinformatics and Photonics (CiBioFi), Universidad del Valle); Mr LOAIZA MORENO, Victor Alfonso (Centre for Bioinformatics and Photonics (CiBioFi), Universidad del Valle); Mr SALAZAR ESTRADA, William Esteban (Centre for Bioinformatics and Photonics (CiBioFi), Universidad del Valle)

Presenter: LENIS TRUJILLO, Jeison Stiven (Universidad del Valle)