

Simulations of dark energy cosmologies

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Abstrak

A major outstanding problem in physics is understanding the nature of the dark energy that is driving the accelerating expansion of the Universe. This thesis makes a significant contribution by demonstrating, for the first time, using state-of-the-art computer simulations, that the interpretation of future galaxy survey measurements is far more subtle than is widely assumed, and that a major revision to our models of these effects is urgently needed. The work contained in the thesis was used by the WiggleZ dark energy survey to measure the growth rate of cosmic structure in 2011 and had a direct impact on the design of the surveys to be conducted by the European Space Agency's Euclid mission, a 650 million euro project to measure dark energy.