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Refinements of Jungle Universes

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How effective barotropic matter can emerge from the interaction of cosmological fluids in an isotropic and homogeneous cosmological model ?

The dynamics of homogeneous and isotropic Friedmann-Lemaître-Robertson-Walker universes is a natural special case of generalized Lotka-Volterra systems where each of the universe's fluid components can be seen as a competitive species in a predator-prey model. (Jungle universe
arXiv:1306.1037v2)

In addition to numerical simulations illustrating this behaviour among the barotropic fluids filling the universe, we analytically pinpoint that effective time-dependent barotropic indices can arise from a physical coupling between those fluids which dynamics could then look like that of another type of cosmic fluid, such as a cosmological constant.

As the nature of dark energy still remains discussed today, this dynamical approach could help understanding some of the properties of dark matter and dark energy at large cosmological scales.

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