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15 years of Titan General Circulation Modeling

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Fifteen years have passed since superrotation was first reproduced with a Titan general circulation model. Early models, which were modified terrestrial GCMs to account for Titan's slow rotation rate and basic energy balance mechanisms, have since evolved to include more realistically a number of closely coupled phenomena: a seasonally varying radiative budget, large-scale wave motions, haze microphysics, atmospheric photochemistry, condensation, cloud formation and surface-atmosphere interactions. If ever-increasing complexity and integration has helped interpret some long-lasting Titan mysteries, it has also had its shortcomings, such as increasing computational costs and an oversimplification of some of the processes included. In this work I will present an overview of general circulation modeling of Titan's troposphere and stratosphere over the last 15 years, its main results and difficulties, comparing methods and results and putting them into perspective with observations and more recent developments.