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Dynamical consistency conditions for rapid turn inflation

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We derive consistency conditions for sustained slow roll and rapid turn inflation in two-field cosmological models with oriented scalar field space, which imply that inflationary models with field-space trajectories of this type are non-generic. In particular, we show that third order adiabatic slow roll, together with large and slowly varying turn rate, requires the scalar potential of the model to satisfy a certain nonlinear second order PDE, whose coefficients depend on the scalar field metric. We also derive consistency conditions for slow roll inflationary solutions in the so called "rapid turn attractor" approximation, as well as study the consistency conditions for circular rapid turn trajectories with slow roll in two-field models with rotationally invariant field space metric. Finally, we argue that the rapid turn regime tends to have a natural exit after a limited number of e-folds.

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