



Contribution ID: 141

Type: **Parallel talk**

Backreaction in Axion Monodromy, 4-forms and the Swampland

Tuesday, 20 June 2017 16:30 (15 minutes)

Axion monodromy models can always be described in terms of an axion coupled to 3-form gauge fields with non-canonical kinetic terms. The presence of the saxions parametrisng the kinetic metrics of the 3-form fields leads to backreaction effects in the inflationary dynamics. We analyse the case in which saxions backreact on the Kähler metric of the inflaton leading to a logarithmic scaling of the proper field distance at large field. This behaviour is universal in Type II string flux compactifications and consistent with a refinement of the Swampland Conjecture. The critical point at which this behaviour appears depends on the mass hierarchy between the inflation and the saxions. However, in tractable compactifications, such a hierarchy cannot be realised without leaving the regime of validity of the effective theory, disfavouring transplanckian excursions in string theory.

Presentation type

Parallel talk

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