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Geometrical destabilization during inflation

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In multi-field inflationary models couplings between fields are not limited to a potential of the model, but can also be present in kinetic terms. In such a case, they can be interpreted as a non-trivial structure of the space of fields. Non-vanishing curvature of this space can lead, if negative, to a new phenomenon called geometrical destabilization.

For example, α-attractors are inflationary models in which geometrical destabilization takes place after inflation, during preheating. It causes intensive production of spacial fluctuations of fields which efficiently siphon energy from homogeneous inflaton mode, leading to nearly instantaneous reheating.

The geometrical destabilization not necessarily happens after inflation. It can also take place during inflationary epoch. One may suppose that it poses a~threat to a successful inflation, as it may lead to its premature end. However, our studies have shown that this is not the case. The instability is shut down by the so-called kinematic backreaction and the inflation proceeds further as a 'side-tracked' inflation.

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