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# A small projective resolution of complex K-theory

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Around 1982 Nick Kuhn proved that the symmetric powers of the sphere spectrum give rise to a minimal projective resolution of $HZ$. He then asked if there were other interesting examples of small projective resolutions of spectra, in particular of spectra like $bo$ or $bu$. In this talk I will show how to construct a small projective resolution of the connective K-theory spectrum $bu$. Our resolution has many similarities to the classic one that arises from the symmetric powers filtration. We give a unified proof of exactness of both resolutions, that is different from Kuhn's proof. A key ingredient in our proof is a vanishing result for the Bredon homology of the complex of partitions and the complex of direct-sum decompositions. Joint work with Kathryn Lesh.

**Auteur principal:** ARONE, Greg (Stockholm)

**Orateur:** Prof. ARONE, Greg

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