Nilpotent operators for vector spaces with invariant subspaces and weighted projective lines

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This is a report on joint work with Dirk Kussin and Helmut Lenzing. We are investigating categories $\mathcal{S}(n)$ of vector spaces equipped with a nilpotent operator of nilpotence degree n and an invariant subspace. This topic is going back to an old problem of Birkhoff concerning subgroups and was recently studied using different methods by Ringel and Schmidmeier. Interesting is the case $n = 6$ which is of tubular representation type.

We show that the stable category of $\mathcal{S}(n)$ is triangle equivalent to a stable category of vector bundles over a weighted projective line. We study for these categories tilting objects together with their endomorphism rings, Calabi-Yau properties and the structure of the Auslander-reiten components.