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Support varieties and Hochschild cohomology rings (50-60)

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We define a support variety for a finitely generated module over any finite dimensional algebra Λ in terms of the maximal ideal spectrum of the Hochschild cohomology ring of Λ. This is modelled on what is done in modular representation theory, and the varieties defined in this way are shown to have many of the same properties as for group rings. In fact the notion of a variety in our sense and for principal and non-principal blocks are related by a finite surjective map of varieties. For a selfinjective algebra the variety is shown to be an invariant of the stable component of the Auslander-Reiten quiver. Moreover we give information on nilpotent elements in the Hochschild cohomology ring of Λ, give some examples and applications, and make a comparison with support varieties for complete intersections.