Filtrations in abelian categories determined by a tilting object

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Abstract: A tilting object of projective dimension one in an abelian category determines a torsion pair and consequently every object has a two-step filtration. In joint work with Jensen and Su we discovered that a titling object of projective dimension two determines a triple of disjoint extension closed subcategories subcategories such that every object has a unique functorial filtration of length three. In this lecture, I will discuss the above result and the generalization due to Jason Lo: A titling object of projective dimension n determines $n+1$ disjoint extension closed subcategories such that every object has a unique functorial filtration of length $n + 1$.

References

[1] Jensen, Bernt Tore, Madsen, Dag Oskar and Su, Xiuping. *Filtrations in abelian categories with a tilting object of homological dimension two.* J. Algebra Appl. **12** (2013), no. 2, 1250149, 15 pp

[2] Lo, Jason. *Torsion pairs and filtrations in abelian categories with tilting objets.* DOI: 10.1142/S0219498815501212