Poset structures in Boij-Soederberg theory

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Boij-Soederberg theory is the study of the cone of cohomology tables of coherent sheaves over projective spaces and the cone of standard graded minimal free resolutions over polynomial rings, which have simplicial fan structures induced by partial orders on their extremal rays. I will discuss a new interpretation of these partial orders in terms of the existence of nonzero homomorphisms. These results not only improve our understanding of the sheaves and modules corresponding to the extremal rays of these cones, but they also suggest the naturality of these partial orders and provide tools to study extensions of Boij-Soederberg theory to other projective varieties and nonstandard graded rings. This is joint work with Dan Erman, Manoj Kummini, and Steven V. Sam.