Positivity vs. semi-stability for bundles with vanishing discriminant

Abstract: Positivity properties of vector bundles like ampleness or nefness are rich research topics, mostly studied in the rank 1 case where they have important applications to birational geometry. Semi-stability is another important property due to its application to the construction of moduli spaces. On curves there are connections between the two first observed in work of Hartshorne. In higher dimension a connection exists under the additional assumption that the discriminant of the bundle vanishes. We give algebraic proofs of this valid in arbitrary characteristic.
(joint w/ Adrian Langer)