1160-13-236 **Michael DiPasquale*** (michael.dipasquale@colostate.edu), Mathematics Department, Colorado State University, 1874 Campus Delivery, Fort Collins, CO 80523, and **Nelly Villamizar**.
Regularity of uniform power ideals and the Waldschmidt constant.

A power ideal is an ideal generated by powers of linear forms; a uniform power ideal is one which is generated by the same power of every linear form. Power ideals appear in a variety of contexts; our motivation for studying these ideals is drawn from applications to multivariate splines.

In this talk we present a bound on the regularity of a uniform power ideal which is linear in the common power of the linear forms; the slope of this linear bound is given in terms of the Waldschmidt constant of the dual set of points. The Waldschmidt constant is an asymptotic measure of the minimum degree a polynomial must have in order to vanish to high order at the set of points. Our bound is derived using apolarity (or Maucalay/Matlis duality) and is asymptotically sharp: as the common power on the linear forms increases, the bound converges to the regularity of the power ideal. While the Waldschmidt constant of a set of points is extremely difficult to compute, there are several lower bounds on the Waldschmidt constant which show that the regularity of a uniform power ideal is closely linked to the smallest degree of a polynomial vanishing at the dual set of points. This is part of a joint work with Nelly Villamizar. (Received August 10, 2020)