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Tyler Kloefkorn* (tkloefkorn@math.arizona.edu). *Weakly Cohen-Macaulay posets and a class of finite-dimensional Koszul algebras.*

Given a finite ranked poset Γ , we study an associated finite-dimensional graded quadratic algebra, R_Γ . Assuming Γ satisfies a combinatorial condition known as uniform, R_Γ is related to a well-known algebra, the *splitting algebra* A_Γ . Splitting algebras were first introduced by Gelfand, Retakh, Serconek, and Wilson, and they originated from the problem of factoring non-commuting polynomials. We ask: Is R_Γ Koszul? The Koszulity of R_Γ is related to the Cohen-Macaulay property of Γ . Kloefkorn and Shelton proved that if Γ is a finite ranked cyclic poset, then Γ is Cohen-Macaulay if and only if Γ is uniform and R_Γ is Koszul. We define a new generalization of Cohen-Macaulay, weakly Cohen-Macaulay. We prove: if Γ is a finite ranked cyclic poset, then Γ is weakly Cohen-Macaulay if and only if R_Γ is Koszul. (Received July 19, 2016)