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74078. *LCM lattices and pure resolutions.*

The LCM lattice of a monomial ideal  $I$  is the lattice of all lcms of minimal generators of  $I$ , ordered by divisibility. Amazingly, the multigraded Betti numbers of  $I$  are encoded in this lattice as homological ranks of intervals. When  $I$  is a monomial ideal with a pure resolution, its LCM lattice satisfies a certain topological condition that we call homological monotonicity. We show a converse to this condition: If a lattice  $L$  is homologically monotonic, then there must be an ideal  $I$ , with pure resolution, whose LCM lattice is  $L$ . (Received January 19, 2016)