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Cohen-Macaulayness of Initial Ideals of Normal Toric Ideals. Preliminary report.

More than fifteen years ago Sturmfels asked whether a normal toric ideal has a Cohen-Macaulay monomial initial ideal. By a theorem of Hochster, normal toric ideals themselves are known to be Cohen-Macaulay, but whether this property passes to some monomial initial ideal is not clear. We show that initial ideals associated to what we call normal liftings are Cohen-Macaulay, and we provide an effective test for the normal lifting property. We will also provide examples where normal toric ideals without such liftings can still have Cohen-Macaulay initial ideals. (Received February 06, 2018)