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# Results and open problems passing from a local ring to its associated graded ring

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Let (A,m) be a complete local ring and G= gr_{m}(A) its associated graded ring. The problem of the descent of a property from G to A was extensively studied and the answers are predominantly positive. The problems arise passing from A to G, because we may lose many good geometric and algebraic properties. We present an overview up to a recent work with A. De Stefani and M. Varbaro. We introduce a homogenization technique which allows to relate Gto the special fiber and A to the generic fiber of a "Groebner-like"deformation. Using this technique we prove sharp results concerning the connectedness of A and G.

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