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**Avraham Aizenbud\*** (aizenr@gmail.com). *Cohen-Macaulay property in representation theory.*

This is a report about work in progress, joined with Eitan Sayag.

I will introduce several phenomena that occurs throughout representation theory of local and global groups. I'll mainly concentrate on the case of  $p$ -adic groups. These phenomena includes regular behavior of multiplicity of a representation when one varies the parameter of the representation, density of regular orbital integrals, and freeness of modules over Hecke algebras. Often, when one tries to make these phenomena to a statement, one sees that either this statement is too weak or it is wrong. We believe that all these phenomena could be explained by the Cohen-Macaulay property of the regular representation attached to an homogenous space. We believe that this property is true in wide generality (for example the generality of spherical spaces) and we have proved them in some special cases. We have also shown that this property explains some of those phenomena. (Received June 22, 2011)