999-14-251 **Karen A. Chandler*** (`chandler@math.harvard.edu`), Harvard Math Department, One Oxford Street, Cambridge, MA 02138. *Conjectures on ideals and singularities.* Preliminary report.

We shall describe current progress on conjectures of Froberg and Iarrobino. These conjectures give predictions on the dimension of each graded piece of a homogeneous ideal of $k[X_0, \ldots, X_n]$ with d generators. Dually, these apply to a homogeneous ideal given by hypersurfaces of P^n with prescribed orders of singularity on a collection of d points.

Previously, we showed that the weak conjecture in P^n follows from certain cases of the strong conjecture in lower dimension. This result allowed, for example, verification of the weak conjecture in P^3 although the complete story on the strong conjecture in P^2 is still far from the ending. Let us note, roughly, that: (a) of course, within P^n, the weak conjecture follows immediately from the strong one; however, (b) as soon as the weak conjecture is known to hold in P^n it becomes "much easier" to obtain the strong one there.

We shall introduce here direct methods of validating the weak conjecture overall. This requires closer examination of the base locus associated to orders of vanishing on points, along with a combinatorial rearrangement on associated schemes. (Received August 23, 2004)