1041-14-182 **Johannes Kleppe*** (johannkl@math.uio.no), Sofies gate 3A, 0170 Oslo, Norway. *Additive splittings of homogeneous polynomials.*

First we will define when a homogeneous polynomial f decomposes or "splits" additively. Up to base change this means that it is possible to write $f = g + h$ where g and h are polynomials in independent sets of variables. This simple notion naturally leads us to define a set M_f of matrices associated to f. Surprisingly, M_f turns out to be a commutative matrix algebra when $\deg f \geq 3$. We show how all (regular) splittings $f = g_1 + \cdots + g_n$ can be computed from M_f.

Next we show how to find the minimal free resolution of the graded Artinian Gorenstein quotient $R/\mathrm{ann}(f)$, assuming the minimal free resolutions of its additive components $R/\mathrm{ann}(g_i)$ are known. From this we get simple formulas for the Hilbert function and the graded Betti numbers of $R/\mathrm{ann}(f)$. We may use this to compute the dimension of a "splitting subfamily" of the parameter space $\mathrm{PGor}(H)$. Its closure is quite often an irreducible component of $\mathrm{PGor}(H)$. (Received August 11, 2008)