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Claudia Polini* (cpolini@nd.edu), Department of Mathematics, University of Notre Dame, Notre Dame, IN. *Cayley-Bacharach schemes and their cores*. Preliminary report.

In joint work with Fouli and Ulrich, we describe explicitly the core of the homogeneous maximal ideal of a standard graded reduced Cohen-Macaulay k -algebra. An application of our result characterizes Cayley-Bacharach schemes in terms of the structure of the core of the maximal ideal of their homogeneous coordinate ring, denoted by $\text{core}(X)$. Recall that a set of s points in \mathbb{P}^n is called a Cayley-Bacharach scheme if every subset of $s - 1$ points has the same Hilbert function. In particular, we show that a scheme X is Cayley-Bacharach if and only if $\text{core}(X)$ is as small as possible, equivalently, X is Cayley-Bacharach if and only if $\text{core}(X)$ is a power of the maximal ideal. (Received September 23, 2006)