We report a joint work in progress with Simon Brendle and Pengfei Guan. Consider the space forms $N^{n+1}$ with metric $ds^2 = d\rho^2 + \varphi^2(\rho)dz^2$. We consider the following hypersurface curvature flow: $\partial_t X = (\varphi'/F - u/c_n)v$, where $F := \sigma_{k+1}/\sigma_k$, $v$ is the unit outward normal vector, and $u$ is the support function. When the space form is Euclidean space, this flow reduces to the (normalized) inverse mean curvature flow studied by Gerhardt, Urbas. For hyperbolic and spherical spaces, this flow is new. We will present a convergence result and some applications in isoperimetric type inequalities.