# ON A MODIFIED MEAN CURVATURE FLOW

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In recent years various evolution equations have been studied in differential geometry. In a landmark paper Hamilton [4] studied the deformation of Riemannian metrics on compact manifolds in direction of their Ricci-curvature:

$$\frac{d}{dt} g_{ij} = -2Ric_{ij} + \frac{2}{n} r g_{ij} \tag{1}$$

Here $g_{ij}$ is the Riemannian metric, $Ric_{ij}$ is the Ricci curvature and $r = \fint R d\mu$ is the average of the scalar curvature on the manifold. This is a weakly parabolic system and Hamilton showed that on a three dimensional manifold any initial metric of positive Ricci-curvature flows into a metric of constant positive curvature when evolved by equation (1). This result was later extended to higher dimensions in [5] and [7].

In [6] we studied the mean curvature flow, that is an evolution equation for hypersurfaces $M^n$ embedded in $\mathbb{R}^{n+1}$: Let the initial hypersurface $M_0^n$ be given locally by some diffeomorphism

$$F_0 : U \subset \mathbb{R}^n \longrightarrow F_0(U) \subset M_0 \subset \mathbb{R}^{n+1} ,$$

then we want to find a whole family $F(.,t)$ of diffeomorphisms corresponding to hypersurfaces $M_t$ such that the evolution equation

$$(2) \qquad \begin{aligned} &\frac{d}{dt} F(\vec{x},t) = -H(\vec{x},t) \, .\nu(\vec{x},t) \qquad \vec{x} \in U \\ &F(.,0) = F_0 \end{aligned}$$