

Contents

| | |
|--|----|
| Chapter 1 MCF of Hypersurfaces in \mathbb{E}^{n+1} | 1 |
| 1.1 超曲面的局部几何 | 1 |
| 1.1.1 协变导数、Gauss-Weingarten 公式 | 1 |
| 1.1.2 曲率张量、Ricci 换序公式 | 4 |
| 1.1.3 Gauss 方程、Codazzi-Mainardi 方程 | 7 |
| 1.2 MCF and its short time existence | 8 |
| 1.3 Evolution equations | 12 |
| 1.4 Long term existence | 19 |
| 1.5 Some special solutions to the MCF | 25 |
| 1.5.1 Homothetic solutions | 25 |
| 1.5.2 Graph solutions | 26 |
| Chapter 2 Huisken Theorem | 28 |
| 2.1 Preserving convexity | 28 |
| 2.2 Huisken's pinching estimate | 33 |
| 2.3 Gradient of H | 48 |
| 2.4 Asymptotic behavior | 54 |
| 2.5 Convergence of the normalized flow | 58 |
| Chapter 3 Singularity Analysis | 68 |
| 3.1 Maximum Principle | 68 |
| 3.2 Type I blow-up models | 73 |
| 3.3 Self-similar solutions | 80 |
| 3.4 Type II blow-up models | 85 |

| | |
|---------------------------------------|------------|
| 3.5 Li-Yau type Harnack estimate..... | 93 |
| 3.6 Eternal solitons | 101 |
| Bibliography | 105 |