Note Taker Checklist Form -*MSRI*

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Talk Title and Workshop assigned to:
Symplectic Mean curvature flow

Lecturer (Full name): Jiayu Li
Date & Time of Event: 11:00 am – 12:00 pm

Check List:

( ) Introduce yourself to the lecturer prior to lecture. Tell them that you will be the note taker, and that you will need to make copies of their own notes, if any.

( ) Obtain all presentation materials from lecturer (i.e. Power Point files, etc). This can be done either before the lecture is to begin or after the lecture; please make arrangements with the lecturer as to when you can do this.

( ) Take down all notes from media provided (blackboard, overhead, etc.)

( ) Gather all other lecture materials (i.e. Handouts, etc.)

( ) Scan all materials on PDF scanner in 2nd floor lab (assistance can be provided by Computing Staff) – Scan this sheet first, then materials. In the subject heading, enter the name of the speaker and date of their talk.

Please do **NOT** use **pencil** or colored pens other than black when taking notes as the scanner has a difficult time scanning pencil and other colors.

Please fill in the following after the lecture is done:

1. List 6-12 lecture keywords: Symplectic Mean curvature flow

2. Please summarize the lecture in 5 or less sentences.

Once the materials on check list above are gathered, please scan ALL materials and send to the Computing Department. Return this form to Larry Patague, Head of Computing (rm 214)

3-15-07. By Jiayu Li. (11:00 – 12:00pm)

Title: Sympletic MCF.

$F_0: \Sigma \to M$

$F(\cdot,t): \Sigma \to M$

$F(\cdot,t) = \Sigma_t$.

$$\begin{cases} \frac{\partial F}{\partial t} = H \\ F|_{t=0} = F_0. \end{cases}$$

$H(x, x_0, t, t_0)$ backward heat kernel

$\rho(x, x_0, t, t_0) = 4\pi(t_0 - t) H$,

$\phi(x_0, t, t_0) = \int_{\Sigma_t} f\rho \, d\mu$

$$\frac{\partial \phi_t}{\partial t} = -\int_\Sigma f \left| H + \frac{(F-x_0)^\perp}{2(t_0-t)} \right|^2 d\mu_t + \int_{\Sigma_t} (\partial_t - \Delta) f \rho \, d\mu_t.$$

B. White:

$\exists\ \varepsilon_0 > 0$, s.t. if $\phi(x_0, t_0 - r^2, t_0) < 1 + \varepsilon_0$

$\sup |A|^2 \le C(\varepsilon_0)$.

$B_{\frac{r}{2}}\ x(t_0 - \frac{|x|^2}{4}\ t_0)$

M: K-E surface. ω Kähler form

Σ: $\omega|_\Sigma = \cos\alpha \, d\mu_t$

by chern – wilform.

$\cos\alpha \equiv 1$. Σ hol curve

$\cos\alpha \equiv 0$ Σ Lag.

$\cos\alpha > 0$ Σ sympletic

Chen-Tian-Jing. W.T. Wang

$(\frac{\partial}{\partial t} - \Delta)\cos\alpha = |\nabla J|^2 \cos\alpha + R \sin^2\alpha \cos\alpha$

$J(e_1) = -e_2$, $J(e_2) = e_1$ $J(u_1) = -u_2$. $J(u_2) = V$.

$\frac{1}{2}|H|^2 \le |DJ|^2 \le 2|A|^2$.

Σ_0 syplectic. Σ_t symplectic.

$(\frac{\partial}{\partial t} - \Delta) \sin^2 t \doteq -|\nabla\pi|^2 \cos\alpha - 2R \sin^2\frac{\alpha}{2} \cos^2\frac{\alpha}{2} \cos\frac{\alpha}{2}$

$R > 0$. $\sup_{\Sigma_t} \sin\frac{\alpha}{2} \le C e^{-CRt}$

1. Introduce surface closed to a hol. curve

Σ, Han

$$\int_{\Sigma_t} \frac{\sin^2\alpha}{\cos\alpha} \le C_n e^{-Rt}$$

$$\Rightarrow \int_0^T \int_{\Sigma_t} |H| \, d\mu_t \, dt \le \left(\int_{\Sigma} \frac{\sin^2\alpha}{\cos\alpha} \, d\mu_t \right) \frac{C}{1-e^{-t}}$$

Remark. If Σ is smooth, $\lim_{r \to 0} \phi(x_0, t_0+r^2, t_0) = 1$

$\exists x_0$, s.t. $x_0 \in \Sigma$

$\phi(x_0, t_0-r^2, t_0) < \frac{\varepsilon_0}{2}$

Thm. $R>0$. If $\sin\alpha < \varepsilon_1$, $\varepsilon_1 < c_0 r_0^6$

then sympletic MCF $\exists$ grobally & course to a hol. curve.

2. Finite blow-up singularity; (refer to the paper: "Dirac-harmonic maps" Math. Z (2006) 254 409-432.

Thm3. There is no type I singularity.

4: There is no translating solution C^2.

We say Σ_t is a translating solution of $T = T|_{T\Sigma} + H$

$\Sigma_t = \Sigma + tT$.

$\Sigma = (x, y, -\log x, 0)$

$T = (0, 0, 1, 0)$, $x \in (-\frac{\pi}{2}, \frac{\pi}{2})$

Thm. There is no complete sympletic translation solution in C^2. W.

$\cos\alpha = \delta > 0$ which is Not minimum.

$$\phi = \frac{|H|^2}{(2\cos\alpha - \delta)}$$

$$-\Delta \cos\alpha = |DJ|^2 \cos\alpha + D_{T/c} \cos\alpha$$

$$\Delta\phi \ge C_\delta \phi^2 + b\nabla\phi$$