Cartwheel teamB final project

Group member: Hongrui Wu, Ross Pappas, William Wylie-Modro, Yaoguang Zhai,

Purpose: To find the time independent ring galaxy formation by observing the perturbed disk galaxy. Compare the results with the "Cartwheel Galaxy".

Galactic Model

1)   Model we used:

 Plummer; Kuzmin and Toomre(KT)

2) Galaxy Type

- Disc – KT – 8,000 Stars

- Halo – PL – 30,000 Stars -

- Bulge – PL - 2,000 Stars – 1/3 * Mass

- Companion – PL – 4,000 Stars – 2/3 * Mass

Code structure

1)Leap Frog – Verlet

- As in HW, the main algorithm to perform the simulation

Tree Code

- Octree at beginning of the simulation

- Get F/A on each particle

- Maintain tree when particle moves (delete leaf, then reinsert the particle)

Team Contribution

Ross Pappas——Exploring Adiabatic Compression and its relation with ring galaxy deeply(as shown in slides); Collect team's ideas and result, making presentation powerpoint; Generating initial condition based on hand calculating and own code.

Honguri Wu——- Learning and arrange the galactic package; generated initial bulge—disk—halo galaxy and four types companions mentioned in the assigned article. Debug N-body and leapfrog code used in the simulation.

Yaoguang Zhai——Developing tree code **independently**. Tree code constructor and debugger. Implement of N-body code. Making gif animation showed in the presentation.

William Wylie-Modro—N-body and Leapfrog code Implementation. Modify N-body and leapfrog code we used in midterm to read the galaxy by galactic package. Helping Yaoguang with tree code debug.

(CUDA works shown in the last page of the slides by Ross)

CREDITS:

Presentation Manager: Ross Pappas
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Co-Lead N-Body Coder(s): William Wylie-Modro
Lead Theoretical Physicist: Ross Pappas

Lead User of Galactic Package: Hongrui Wu
Hypothetic CUDA Developers #1: William Wylie-Modro
Hypothetic CUDA Developers #2: Ross Pappas
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Tree Code Analyzer: Ross Pappas

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