

THE APPLES WITH APPLES PROGRAMME

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**HISTORY: COMMUNITY RESOURCE ORIGINATING
FROM MEXICO CITY 2002 NUMERICAL RELATIVITY
WORKSHOP**

BINARY BLACK HOLE WAVEFORMS ARE CRUCIAL FOR GRAVITATIONAL WAVE ASTRONOMY

SOME IMPORTANT QUESTIONS

**DATA ANALYST: WHY SHOULD I BELIEVE THIS
CODE'S WAVEFORMS?**

Read the code?

Trust the numerical relativist?

**NUMERICAL RELATIVIST: HOW DO I CHECK MY
CODE?**

Run the two black hole problem and see how many orbits
I get?

OR

- Standardized testbeds
- Comparison of codes based upon different formalisms

GOALS OF APPLES WITH APPLES PROJECT

- **DEVELOP STANDARDIZED TESTBEDS FOR CODE COMPARISON**
- **CREATE A WEB SIT FOR SHARING INFORMATION AND COORDINATING TESTS**
- **CREATE A CVS REPOSITORY FOR STORING AND DISPLAYING TEST RESULTS**
- **CONTINUE A SERIES OF WORKSHOPS**

FIRST ROUND OF TESTS

SIMPLE TESTS THAT CAN EASILY BE CARRIED OUT
WITH MOST 3D CAUCHY CODES

ISOLATE STAGES: FIRST TEST THE EVOLUTION
CODE

PERIODIC BOUNDARY CONDITIONS \equiv 3-TORUS
NO BOUNDARY

THE FIRST ROUND TESTS

- **ROBUST STABILITY:** Random perturbations of flat space
- **LINEARIZED WAVE:** Amplitude and phase propagation
- **GAUGE WAVE:** Relativistic dynamic gauge
- **GOWDY WAVE:** Collapsing and expanding curved spacetimes

TOWARDS STANDARD TESTBEDS FOR NUMERICAL RELATIVITY

CLASSICAL AND QUANTUM GRAVITY, TO APPEAR
MEXICO CITY 2002 WORKSHOP PARTICIPANTS

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CVS REPOSITORY AND WEB SITE

AIMS

- DOCUMENT WHAT WORKS AND WHAT DOESN'T
- HELP GROUPS SHARE RESULTS AND KEEP FROM REPEATING THE SAME MISTAKES

WEB SITE: www.appleswithapples.org

- EXPLANATION OF TEST STRATEGY AND DESIGN
- TEST SPECIFICATIONS AND INSTRUCTIONS
- COORDINATE RESOURCES AND INFORMATION

THE CVS IS A REPOSITORY FOR THE OUTPUT FILES FROM THE TESTS

AT PRESENT THE CVS FILES AND THE WEB PAGE ARE NOT LINKED

PLANS FOR THIS MEETING

- COMPLETE AND DISCUSS FIRST ROUND TESTS
- DESIGN SECOND ROUND OF TESTS: Grid boundaries

PLANNING FOR THE FUTURE

- ORGANIZATIONAL STRUCTURE?
- CONTENT AND FORMAT OF WEB PAGE AND CVS?
- MEXICO 3, PLACE, DATE?