A mixed precision implementation in Numerical Weather Prediction models

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PANTHER DG Library

P-
Adaptive
Numerical
Tool for
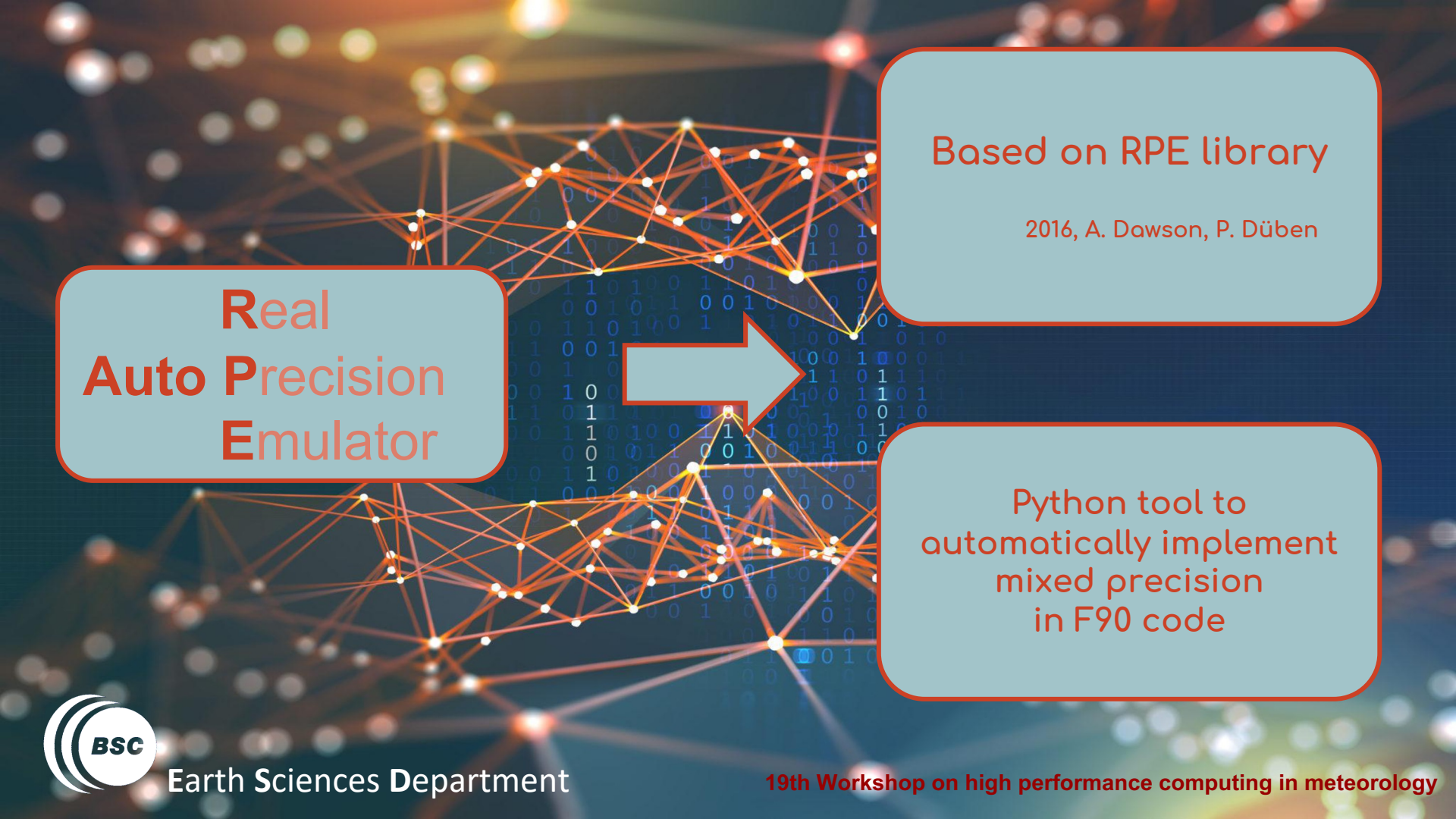**H**igh
ord**E**r
disc**R**etizations

- Object oriented parallel modern Fortran library implementing all the discontinuous Galerkin (DG) operators on the sphere involved in a semi-implicit semi-Lagrangian (SISL) dynamical core prototype

- Modal DG: tensor product of 1-D Legendre polynomials

- Direct addressing of *dofs* as well as quadrature nodes and weights within hexahedral elements

- Indirect addressing of columns of elements vs. direct addressing of elements within columns

- Global arrays of pointers to local column-wise data structures

- One-sided asynchronous communication

- Coupling with Atlas library for mesh generation and optimal partitioning

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ESCAPE 2

Panther based SISL-DG dycore prototype: NLNH lee wave

SISL-DG solution with:

- Horizontal resolution **200m**

- Vertical resolution **100m**

- Maximum pol. deg. **8**
  with different values in the
  vertical and horizontal directions

- Timestep length **2s**

- Acoustic Courant **approx. 20**
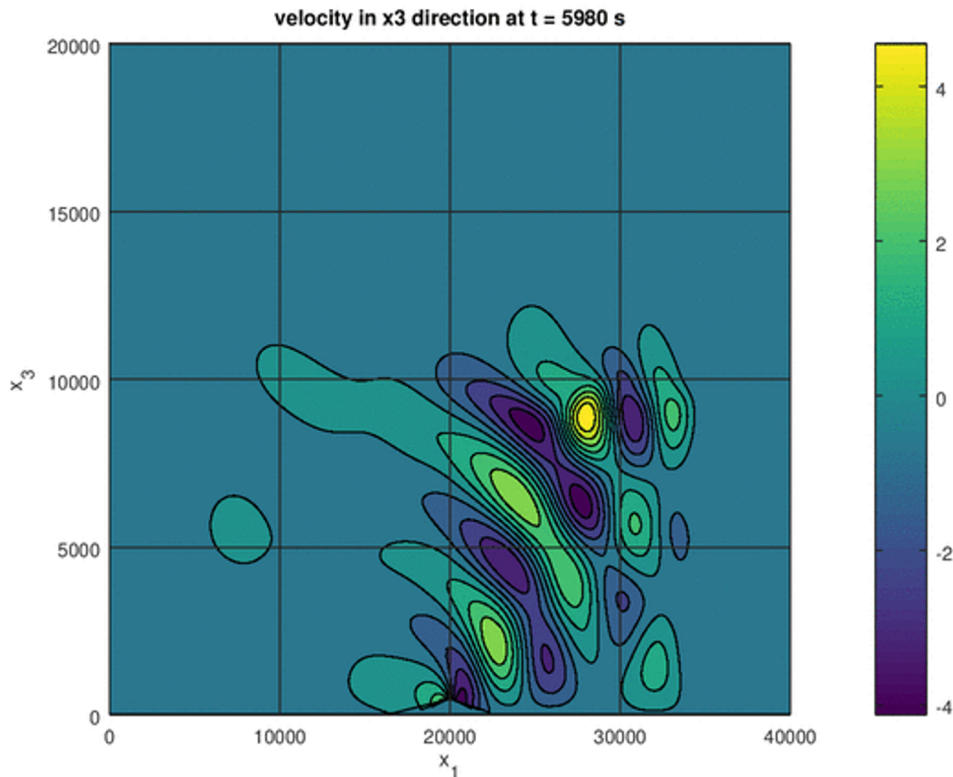
velocity in x3 direction at t = 5980 s

F90 Sources

Preprocessor

Preproc Source Files

Auto-RPE parsing tool

Database

RPE Library

RPE executable

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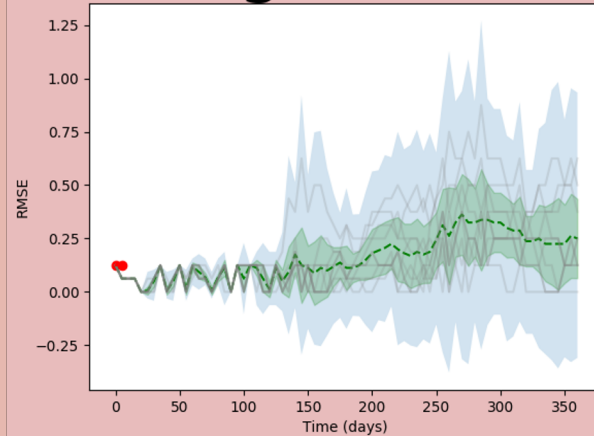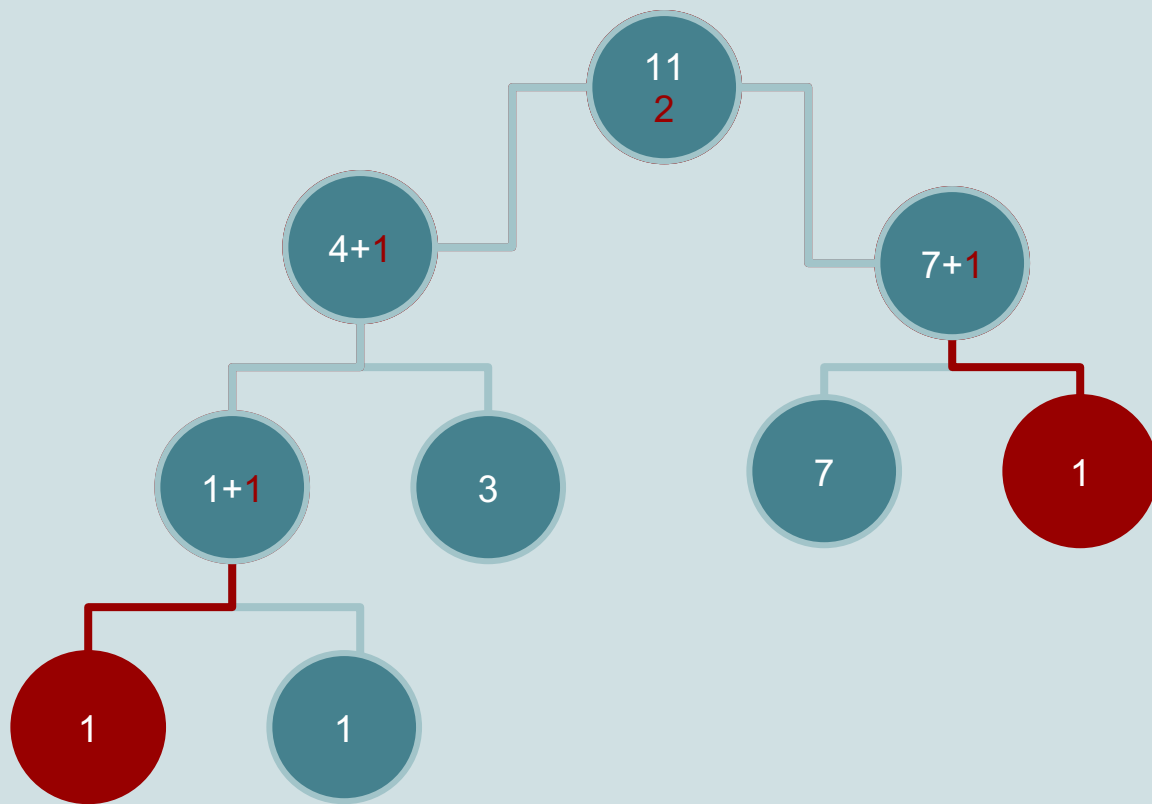**E**arth **S**ciences **D**epartment

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What does it mean to define a test?

bgsaline
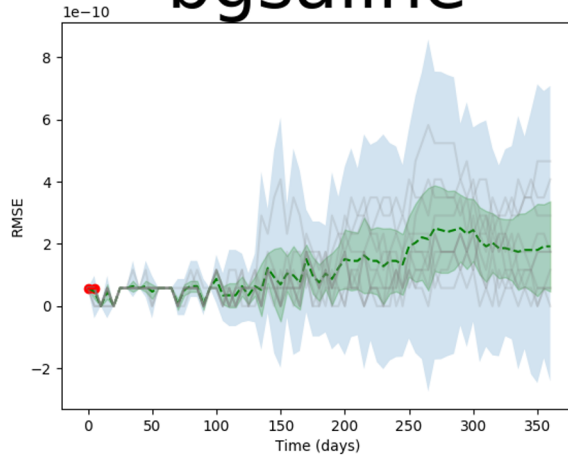
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State of the project

1. Implement the emulator
2. Run the analysis
3. Implement the changes

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Requirements? → The more standard the better

AutoRPE
Developer's
Guidelines ▶▶

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Thanks

the AutoRPE developers teams

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