CompOSE - CompStar Online Supernovae Equations Of State

Stefan Typel for the CompOSE core team

TECHNISCHE UNIVERSITÄT DARMSTADT

New Perspectives on Neutron Star Interiors

ECT*, Trento, Italy, October 09 – 13, 2017

CompOSE core team:

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cost EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

DFG Deutsche Forschungsgemeinschaft

SFB 1245

HELMHOLTZ GEMEINSCHAFT

GSI

Main Features

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  - very flexible data format

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- **documentation**
  - manual and 'how-to' instructions
  - bibliography of EoS publications
  - links to related projects

Repository of EoS Tables

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- **presently available types of tables**
  - 3-dimensional
    - multi-purpose EoS (56 data sets)
  - 2-dimensional
    - zero-temperature EoS (5 data sets)
    - neutron matter EoS (26 data sets)
  - 1-dimensional
    - cold β-equilibrated matter EoS (27 data sets)

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- **EoS files**
  - parameters (temperature, baryon density and hadronic charge fraction): `eos.t`, `eos.nb`, `eos.yq`
  - EoS data: `eos.thermo`, `eos.compo`*, `eos.micro`* ($*$: optional)
  - information on EoS model in data sheet: `eos.pdf`
  - collection of files available as `eos.zip`

Handling of EoS Data I

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- **software**
  - FORTRAN code, version 2.12
    (`compose.f90`, `composemodules.f90`, `Makefile`)
  - 'file version' (needs input files provided by the user)
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- **output files**
  - EoS table: `eos.table`
  - additional information: `eos.report`
  - input for neutron star calculations (if possible): `eos.beta`

Handling of EoS Data II

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- **web interface**
  - access restricted $\Rightarrow$ registration required
  - generation of EoS tables (in preparation)
  - graphical representation of EoS etc.
    (merger with EOSDB website of Chikako Ishizuka, in planning)

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- **LORENE library**
  - cold neutron star EoS can be used as direct input for Nrotstar code
    $\Rightarrow$ properties of rotating neutron stars

Documentation

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- **manual**
  - detailed information on file formats, tabulation scheme, interpolation, . . .
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- **links to other EoS projects**

Interaction with Users

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- **submission of EoS data**
  - contact CompOSE core team by sending email to `develop.compose@obspm.fr`
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- **registration**
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  - full access to all services with password

Future

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- **extension of EoS tables**
  - dependence on other variables?
    (e.g. magnetic field strength, already implemented partly)
  - choice of other primary variables?
  - additional data (e.g. transport properties)?

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  - more EoS tables needed!

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- **other suggestions?**