# SK272

## EoS Submission Details

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|---|---|
| EoS name | SK272 |
| category | nuclear |
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## Abstract

This table corresponds to the zero temperature and $\beta-$equilibrium unified EoS by Gulminelli and Raduta [1]. The considered effective interaction is SK272 [2]. Cluster energy functionals are those of Ref. [3].

## References to the original work

1. F. Gulminelli and Ad. R. Raduta, arXiv:1504.04493.

2. B. K. Agrawal, S. Shlomo and V. Kim Au, Phys. Rev. C 68 (2003) 031304.

3. P. Danielewicz et J. Lee, Nucl. Phys. A818, 36 (2009).

## Further References

## Nuclear Matter Properties[1]

|         | Quantity                                  | Unit      |        |
|---------|-------------------------------------------|-----------|--------|
| $n_S$   | saturation density in symmetric matter    | $fm^{-3}$ | 0.155  |
| $E_0$   | binding energy per baryon at saturation   | MeV       | 16.28  |
| $K$     | incompressibility                         | MeV       | 271.55 |
| $K'$    | skewness                                  | MeV       | 0      |
| $J$     | symmetry energy                           | MeV       | 37.4   |
| $L$     | symmetry energy slope parameter           | MeV       | 91.7   |
| $K_{sym}$ | symmetry incompressibility              | MeV       | -67.8  |

## Neutron Star Properties[1]

|              | Quantity                      | Unit           |       |
|--------------|-------------------------------|----------------|-------|
| $M_{max}$    | maximum mass                  | $M_{sun}$      | 2.24  |
| $M_{DU,e}$   | mass at DUrca threshold with $\mu^-$ | $M_{sun}$ | 0.80  |
| $R_{M_{max}}$ | radius at maximum NS mass    | km             | 11.20 |
| $R_{1.4}$    | radius at 1.4 $M_{sun}$ NS mass | km           | 13.32 |

## eos.thermo

eos.thermo and the three grid defining files are CompOSE standard data files and by definition available. eos.thermo does <u>not</u> necessarily provide all possible data.

| table dimension           | 1    |
|---------------------------|------|
| table type                | 1    |
| total number of grid points | 1231 |

Range and density (#) of the grid parameters:

|       | Quantity          | Unit      | min          | max          | #    |
|-------|-------------------|-----------|--------------|--------------|------|
| T     | Temperature       | MeV       | 0.           | 0            | 1    |
| $n_b$ | Baryon Nr Density | $fm^{-3}$ | 1.E-07       | 1.979903     | 1231 |
| $Y_q$ | Charge Fraction   |           | 1.542962e-02 | 4.374879e-01 | 1    |

T, $n_b$, and $Y_q$ are stored in eos.t, eos.nb, and eos.yq, respectively.

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[1]0-values indicate, that the corresponding data is not provided.

## Further Available Data Files

Files and quantities listed in the following are provided beyond CompOSE's core requirements as outlined in Sec.4.2. of the CompOSE manual.

**eos.compo** : available

| index | particle |
|------:|----------|
| 10 | n |
| 11 | p |
| 0 | $e^-$ |
| 1 | $\mu^-$ |
| | - end of table - |

further particle sets are defined. One set of quadruples for an unique heavy nucleus, see Table 7.2 of the manual.

## Description of Phases

**PHASE INDEX #4 :** heavy nuclei present
**PHASE INDEX #3 :** homogeneous matter