HS(DD2)K^-

EoS Submission Details

EoS name	HS(DD2)K^-
category	hadronic
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Abstract

This is the hadronic EOS table of Ref. [1], which is based on the statistical model of Hempel and Schaffner-Bielich [2] with DD2 interactions [3]. The original model [2,3] has been extended to include K^- mesons[1]. Information on effective masses and chemical potentials has been added.

References to the original work

1. T. Malik, S. Banik and Debades Bandyopadyay, arXiv:2012.10127.
2. M. Hempel and J. Schaffner-Bielich, Nucl. Phys. A 837 (2010) 210.
3. S. Typel, G. Röpke, T. Klähn, D. Blaschke, and H.H. Wolter, Phys. Rev. C 81 (2010) 015803.

Nuclear Matter Properties[1]

	Quantity	Unit	
n_S	saturation density in symmetric matter	fm^{-3}	0.1491
E_0	binding energy per baryon at saturation	MeV	16.02
K	incompressibility	MeV	242.7
K'	skewness	MeV	168.7
J	symmetry energy	MeV	31.67
L	symmetry energy slope parameter	MeV	55.03
K_{sym}	symmetry incompressibility	MeV	-93.2

Neutron Star Properties[1]

	Quantity	Unit	
M_{max}	maximum mass	M_{sun}	2.19
$M_{DU,e}$	mass at DUrca threshold (1/9) w/o μ^-	M_{sun}	0
$R_{M_{max}}$	radius at maximum NS mass	km	12.14
$R_{1.4}$	radius at 1.4 M_{sun} NS mass	km	13.22

eos.thermo

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

table dimension	3
table type	1
total number of grid points	1462860

Range and density (#) of the grid parameters:

	Quantity	Unit	min	max	#
T	Temperature	MeV	0.1E+00	0.15848932E+03	81
n_b	Baryon Nr Density	fm^{-3}	1.0E-12	1.0	301
Y_q	Charge Fraction		0.10000000E-01	0.60000000E+00	60

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

[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
424	K^- (Thermal)
425	K^- (Condensate)
	- end of table -

The listed particle number fractions are net fractions, i.e., they are given by the difference between the correspoding particle and anti-particle fractions except in the condensate. Further particle sets are defined.

index	description
1	Average fraction, mass and proton number for heavy nuclei ($Z \geq 6$)
2	Average fraction, mass and proton number for light nuclei ($Z \leq 5$)
	- end of table -

eos.micro : available

index	quantity	particle
10041	Dirac effective mass divided by particle mass m_i^D/m_i	n
11041	Dirac effective mass divided by particle mass m_i^D/m_i	p
100041	Dirac effective mass divided by particle mass m_i^D/m_i	K^-
	- end of table -	