# Thermodynamics of absolute stiff matter

Ernst Trojan, George V. Vlasov

*(Submitted on 9 Jul 2011 (v1), last revised 4 Oct 2011 (this version, v5))*

The 'absolute stiff' matter ($P=E$) can be a Fermi or Bose gas of particles with the energy spectrum $\epsilon_p \sim p^q$ in $q$-dimensional space, particularly $\epsilon_p =p^3/m^2$ in 3-dimensional space. We obtain its pressure, particle number density and heat capacity at finite temperature. The behavior of 'absolute stiff' medium is determined by characteristic temperature $T_c=6\pi ^2n/(\gamma m^2)$. At low temperature the heat capacity obeys the linear law $C_V\sim T$ for both fermionic and bosonic matter, the pressure of 'absolute stiff' fermions $P\sim n^2+O(T^2)$, while the 'absolute stiff' Bose gas never reveals Bose-Einstein condensation.

Comments: 14 pages

Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO)**; Solar and Stellar Astrophysics (astro-ph.SR); Statistical Mechanics (cond-mat.stat-mech); High Energy Physics - Phenomenology (hep-ph)

Cite as: **arXiv:1107.1782 [astro-ph.CO]**

(or **arXiv:1107.1782v5 [astro-ph.CO]** for this version)

## Submission history

From: Ernst Trojan [view email]

**[v1]** Sat, 9 Jul 2011 12:52:13 GMT (7kb)

**[v2]** Tue, 12 Jul 2011 21:32:04 GMT (7kb)

**[v3]** Wed, 3 Aug 2011 23:00:49 GMT (7kb)

**[v4]** Fri, 5 Aug 2011 18:19:38 GMT (7kb)

**[v5]** Tue, 4 Oct 2011 22:44:09 GMT (8kb)

*Which authors of this paper are endorsers?*



## Download:

- PDF
- PostScript
- Other formats

Current browse cont

**astro-ph.CO**

**< prev | next >**

new | recent | 1107

Change to browse b

astro-ph
astro-ph.SR
cond-mat
cond-mat.stat-mech
hep-ph

References & Citatio

- INSPIRE HEP (refers to | cited by)
- NASA ADS

Bookmark(what is this?)