

# Possible Phase Diagram of Superfluid $^3\text{He}$ in Highly Anisotropic Aerogel

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Recent NMR measurements on superfluid  $^3\text{He}$  in highly anisotropic aerogel have given a convincing evidence that the polar pairing state is the equal-spin pairing (ESP) phase at lower pressures and continuously transforms to the deformed B-phase at lower temperature with no intermediate deformed A-phase.<sup>1</sup> In the present work, we extend our previous calculation<sup>2</sup> to a much more anisotropic case to justify the direct polar to (deformed) B transition. On the other hand, we argue that the polar phase is not lost even at higher pressures, and that an extremely deformed A to polar transition should be seen in the ESP phase with increasing pressure. The half-quantum vortex which, under rotation, should be stable in the polar phase will also be discussed.

1. R. Sh. Ashkhadulin *et al.*, Phase diagram of superfluid  $^3\text{He}$  in nematically ordered aerogel, Pis'ma v ZhETF (JETP Lett.) **95**, 355 (2012).
2. K. Aoyama and R. Ikeda, Pairing states of superfluid  $^3\text{He}$  uniaxially anisotropic aerogel, Phys. Rev. B **73**, 060504(R) (2006).

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