

NON-CONVENTIONAL ORIGIN OF LARGE-SCALE MAGNETIC FIELDS

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One of the models constructed (Wanas, 1985) within the framework of the generalized field theory (Mikhail and Wanas, 1977) is found to give results in favour of Blackett's speculation concerning rotation and the origin of magnetic fields. The formula giving the surface polar magnetic field of a spherical body of mass M , radius R , and uniform rotational velocity w is given by (Mikhail and Wanas, 1989)

$$B_p = \frac{9}{4} \left(\frac{2M}{R} \right)^{1/2} \cdot w$$

In case of a typical galaxy, the model gives a magnetic field of the order of 10^{-5} Gauss.

References

- Mikhail, F.I. and Wanas, M.I. (1977) Proc. Roy. Soc. London **A356**, 471-481.
Mikhail, F.I. and Wanas, M.I. (1989) to be published.
Wanas, M.I. (1985) Int. J. Theoret. Phys. **24**, 6, 639-651.