

# Magnetic anomaly due to elliptic cylinder in the uniform exciting field

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**Abstract:** The paper presents exact calculation of magnetic field anomaly induced by the uniform geomagnetic field in the presence of two dimensional body with elliptic cross-section. The solution is performed by means of separation of variables in Laplace equation, using orthogonal elliptic cylindrical co-ordinates. The angle between main axis of generating ellipse and inducing field is general. The calculations of  $\Delta T$  and inclination anomaly are presented for two important cases: i) magnetic cylinder embedded in non magnetic medium, ii) non magnetic elliptic cylinder hollow (e.g. gallery) embedded in unbounded magnetic medium. The comparison of results (profile curves  $\Delta T$ ,  $\Delta I$ ) calculated by means of derived analytical formulae and those calculated by means of the boundary integral method used in our previous papers is presented also. Their coincidence is good, namely in the region where the anomalies are most pronounced.

**Key words:** magnetometric models, elliptic cylinder co-ordinates, magnetometric profile measurements, boundary integral methods

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