



Horizontal Intensity
 Contours of horizontal intensity expressed in nanoTeslas. The horizontal component is the projection of the geomagnetic field vector onto the tangent plane attached to a point on the Earth's surface. The horizontal intensity is the field strength (magnitude) of the horizontal component and is always positive. Hachures point in direction of decreasing values.

Secular Variation of Horizontal Intensity
 Contours of the estimated rate of change of horizontal intensity (secular variation) expressed in nanoTeslas per year. To apply change, add algebraically. Hachures point in direction of decreasing values.

Point values of horizontal intensity expressed in nanoTeslas. Point values enclosed by a single contour are local maxima or minima.

Point values of the estimated rate of change of horizontal intensity (secular variation) expressed in nanoTeslas per year. To apply change, add algebraically. Point values enclosed by a single contour are local maxima or minima.

North and south magnetic poles. Magnetic poles are defined as the locations at which the horizontal magnetic intensity, computed from the degree and order spherical harmonic International Geomagnetic Reference Field 2005 model, is effectively zero at 2000.0.

Geomagnetic observatory recording data since 1900

HORIZONTAL INTENSITY CHART THE INTERNATIONAL GEOMAGNETIC REFERENCE FIELD, 2005

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DISCUSSION
 This is one of five world charts showing the declination, inclination, horizontal intensity, vertical component, and total intensity of the Earth's magnetic field at mean sea level at the beginning of 2005. The charts are based on the International Geomagnetic Reference Field (IGRF) main model for 2005 and secular change model for 2005-2010. The IGRF is referenced to the World Geodetic System 1984 ellipsoid. Additional information about the USGS geomagnetism program is available at: <http://geomag.usgs.gov/>.

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SELECTED REFERENCES
 Godekov, V.P., Zvereva, T.I. and Chernova, T.A., 2005. The IZMIRAN main magnetic field candidate model for IGRF-11, produced by spherical harmonic-spherical component method Earth, Planets and Space, v. 57, no. 12, p. 1105-1111.
 Macmillan, Susan, and Maus, Stefan, 2005. International Geomagnetic Reference Field—the tenth generation. Earth, Planets and Space, v. 57, no. 12, p. 1135-1140.
 Maus, Stefan, Macmillan, Susan, and Thomson, Alan, 2005. The IGRF magnetic field candidate models for the 11th generation International Geomagnetic Reference Field. Earth, Planets and Space, v. 57, no. 12, p. 1157-1166.
 Maus, Stefan, Macmillan, Susan, Laves, Frank, and Bowdler, Tatjana, 2005. Evaluation of candidate geomagnetic field models for the 10th generation of IGRF. Earth, Planets and Space, v. 57, no. 12, p. 1173-1181.
 Maus, Stefan, McLean, Susan, Daux, David, Lühr, Hermann, Reber, Martin, Mei, Wolfgang, and Choi, Sungwon, 2005. IGRF-10 candidate models for the 10th generation International Geomagnetic Reference Field. Earth, Planets and Space, v. 57, no. 12, p. 1151-1156.
 Olsen, Niels, Sabaka, T.L. and Laves, Frank, 2005. New parameterization of external and induced fields in geomagnetic field modeling and a candidate model for IGRF 2005. Earth, Planets and Space, v. 57, no. 12, p. 1141-1149.

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