

Bi-national cooperation project for the development of regional magnetic models and charts in Central America

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In the 70's several measurements had been performed in Central America by the Geophysics Institute, UNAM: magnetic repeat stations were visited, and magnetic Declination, Inclination and Intensity were obtained. In this project we takes up these important studies and we work together to occupy an adequate number of magnetic repeat stations in the area (Costa Rica and Mexico) with two purposes principal: update data for regional geomagnetic field models (Southeast of Mexico and Central America); and the exchange of techniques for measurement, processing, and publication of the results in the corresponding catalogs and magnetic charts.

Historically, Mexico and Costa Rica have studied the geomagnetic field and its variations in the region since the 19th century. In the 70's several measurements had been performed in Central America by the Geophysics Institute, UNAM (Sandoval, 1950; Cañón-Amaro, 1991). 29 magnetic repeat stations were visited and Declination, Inclination and Intensity were obtained (Fig.1).

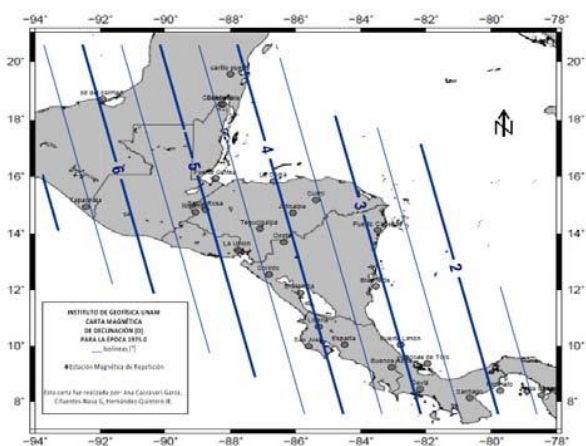


Figure 1: Magnetic declination chart 1975; made with data of Cañón-Amaro, 1991

In Costa Rica, systematic observations of the magnetic field began in 1898 by H. Pittier, who published the first isogonic chart in the area. In 1978 a most detailed study of the magnetic field of Costa Rica was performed and updated later by G. Leandro in 1984. In other hand, in Mexico, the first magnetic observations were made at the end of the 16th century by Cavendish in 1576 in La Paz, B.C. The first Magnetic chart was made in a specific study conducted by the Carnegie Institute in Washington, in 1906. Since 1947, the year in which the IGEF (Geophysics Institute of the UNAM) is founded, it is in charge of publishing the Magnetic Letters for the Mexican Republic, as well as a couple of catalogs with the magnetic values of the Mexican Republic and Central America from 1587-

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1991. In 2010 Declination, Inclination and Intensity chart were published. These studies have been interrupted in recent years in both countries due to problems of lack of logistical and financial support; as well as the relocation of the Chiripa Magnetic Observatory this year.

Since April 2018, 18 magnetic stations in Costa Rica were visited and magnetic data are being processed in collaboration with Mexico. Also in Mexico some magnetic stations have being visited (Fig. 2) and some are going to be visited in next months. We are working in the development of a regional magnetic charts for Mexico and Central America.

Figure 2. Magnetic repeat station Paricutin, Michoacán, Mexico.

The recovery of the magnetic measurements in the 70's and some others in the region of Central America and the present work, will allow to analyze the secular variation in the area. This project resulted in an interesting exercise in collaboration between different Latin American countries and is a contribution to number studies in geomagnetism in the region.

References:

C. Cañón-Amaro., 1991. *Valores Magnéticos en la República Mexicana y Centro América de 1587-1991*.

Cañón-Amaro, 1989. *Variaciones de la Declinación Magnética de la República Mexicana desde 1630*. Serie de Docencia y Divulgación, **38**.

G. Cifuentes, E. Hernández, 1996. *Cartas Magnéticas Sintéticas Época 1995.0 para la República Mexicana*. Reportes Internos, **96-18**.

R. Sandoval, 1950. *La Carta Magnética de México*. 1-30pp

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