Geomagnetic Information Model for 2019

In the narrow sense, "Geomagnetic Information" (GI) refers to the Earth's magnetic field declination (D) and its annual variation (AVD) as marginal information of official and military maps. In order to assess the reliability and update the geomagnetic information, it is necessary to continuously monitor the GI model by observing the Earth's magnetic field. Anew survey of the Croatian Geomagnetic Repeat Station Network, including setup of destroyed locations, was carried out within the 2nd phase of the 2nd Geomagnetic Information Renewal Cycle of the Republic of Croatia in 2018, which is run by the Faculty of Geodesy of University of Zagreb for State Geodetic Administration and Ministry of Defence of the Republic of Croatia. In this year project (the 3rd phase of the 2nd Cycle), the survey of 2018 was reduced and built-in GI2019v1 model, the successor of GI2018v2 (Brkić M.: Monitoring Geomagnetic Information in the Territory of Croatia, Geofizika, Vol. 36, 2019). Additional important upgrade of GI model comprise of selected reduced old topographic maps' declinations of some surrounding countries. Furthermore, the normal annual variation was modelled by a constrained polynomial analysis, into which the input AVD were derived from available last year's observatories data, similarly to (ibid.). The GI2019v1 model consists of digital D and AVD models at the surface and within longitude 12.9°–19.5° and latitude 41.3°–46.6° as well as executable program for computing daily D and GPD in 2019. Estimated maximal error of the GI2019v1 declination was less than 5' at the Basic Geomagnetic Network of Republic of Croatia locations and epoch 2019.0 .

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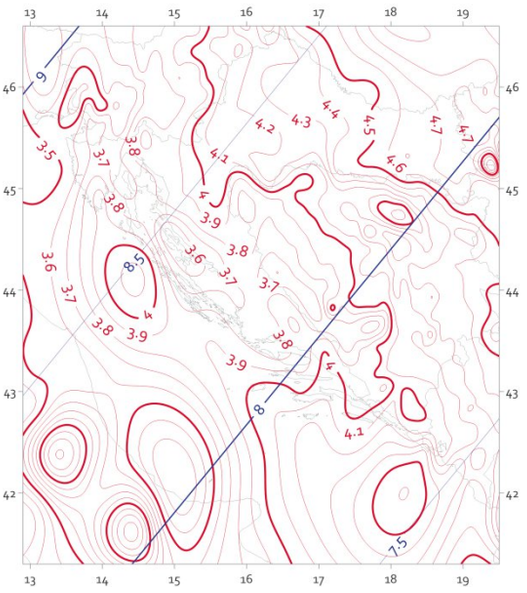

Fig. 1 GI2019v1 D /deg. (red isolines) and AVD /arcmin/yr. (blue) at epoch 2019.0.
Slika 1. GI2019v1 D /st. (crvene izolinije) i GPD /min./god. (plave) za epohu 2019,0.

Model geomagnetske informacije za 2019

U užem smislu, "geomagnetska informacija" (GI) odnosi se na deklinaciju (D) Zemljinog magnetskog polja i njezinu godišnju promjenu (GPD), kao informaciju izvanokvirnog sadržaja službenih i vojnih karata. Za procjenu pouzdanosti i ažuriranje geomagnetske informacije, neophodno je kontinuirano praćenje GI modela opažanjem Zemljinog magnetskog polja. Nova izmjera Hrvatske geomagnetske sekularne mreže, uz uspostavu uništenih lokacija, provedena je 2018. u okviru 2. faze 2. ciklusa obnove geomagnetske informacije Republike Hrvatske, kojeg vodi Geodetski fakultet Sveučilišta u Zagrebu za Državnu geodetsku upravu i Ministarstvo obrane Republike Hrvatske. U ovogodišnjem projektu (3. fazi 2. ciklusa), izmjera iz 2018. reducirana je i ugrađena u GI2019v1 model, nasljednik GI2018v2 (Brkić M.: Praćenje geomagnetske informacije na području Hrvatske, Geofizika, Vol. 36, 2019). Dodatna važna nadogradnja GI modela sastoji se od odabranih reduciranih deklinacija sa starih topografskih karata nekih okolnih zemalja. Povrh toga, normalna godišnja promjena modelirana je polinomnom analizom s ograničenjem, u koju su ulazne GPD izvedene iz raspoloživih prošlogodišnjih opservatorijskih podataka, slično kao u (ibid.). Model GI2019v1 čine digitalni modeli D i GPD na površini i unutar dužine 12.9°–19.5° te širine 41.3°–46.6°, kao i izvršni program za računanje dnevnih D i GPD u 2019. Procijenjena maksimalna pogreška GI2019v1 deklinacije je unutar 5' na lokacijama Osnovne geomagnetske mreže Republike Hrvatske i epohu 2019,0.

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