



**VIHBOGH CONDUCTOR 'OH
BIQ'A'E': TIDAL MAGNETIC
SIGNALS, COAST QOYMEH
PA'MEY, FARADAY BIQTIQ
TOBQA'LU' JE (SABAKA, TYLER,
OLSEN JE, 2016, LUQELLU'TAHVIS)**



vIHbogh Conductor 'oH bIQ'a'e': Tidal Magnetic Signals, Coast QoymeH pa'mey, Faraday bIQtlq tobqa'lu' je (Sabaka, Tyler, Olsen je, 2016, luqellu'taHvIS)

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ngoD

2016 DIS April jar Geophysical Research Letters-Daq Sabaka, Tyler, Olsen je ja': bIQ'a' tides magnetic fields chenmoH 'ej fieldsvam ngu' Swarm satellites. conductor 'oH seawater'e'; tera' magnetic field-Daq bIQvam vIHmoH tides, bIQDaq electric currents chenmoHlu', 'ej orbitvo' magnetic fields juvlaHlu'bogh chenmoH currentsvetlh. 1832 DIS Thames-Daq rapbogh wanl' ngu'meH nID Faraday, 'ach lujpu'.

bIQ'a' retlh QoymeH pa'meyvaD ghu'vam 'oSbogh meq wllaj. Hoch lunar day 2 loqh principal lunar tide magnetic field ghur 'ej nup. qaStaHvIS 3 jar, 3 coast QoymeH pa'mey wa' inland reference room jeDaq local magnetic field wIqonpu'; tidal flow extremes-Daq paired listening sessions DIta'pu'. coast pa'meyDaq tidal period ghaj field choH, 'ej 'oH lurur Qoywl'pu' preferences. inland reference room, Quito-Daq, tidal period ghajbe' field variation 'ej tide rurbe' Qoywl'pu' preferences. coast installations-Daq slack water poHDaq critical listening ta'lu' 'e' wIchup, 'ej tera' field vertical component machDaq pujqu' effect 'e' wIghltlh, 1833 DIS Sociedad Ecuatorial de Quito maqbogh potlh rur.

1. 'ELMEH GHITLH

1832 DIS January jar Waterloo Bridgevo' copper wire cho' Michael Faraday; Thames-Daq plates ghIrmoH. tera' magnetism-Daq vIH bIQtlq, vaj bankvo' bankvaD induced current qeng bIQtlq 'e' pIH. vay' voqlaHbogh tu'be'; platesDaj plch 'ej not principle Hon. DIS veb ghltlhtaHvIS, principle laj Sociedad Ecuatorial de Quito 'ej maq: level dipping needle DaqDaq ngabnIS effect.

ghIq bIQ'a'mey-Daq principle tobpu'lu'; pa' conductor tIn law' Thames conductor tIn puS; plmq' conductor tInghach pathlmey. CHAMP satellite De'Daq principal lunar tide magnetic signal ngu'pu' Tyler, Maus, Lühr je (2003). DaH Swarm mission 20 jar wa'DIchvo' tidal signals tlhappu' Sabaka, Tyler, Olsen je (2016). 2 lower satellites joj plmbogh De' lulo': side by side puv satellitesvam, 'ej vaj latlh sourcesvo' oceanic signal lucheV. principal lunar semidiurnal tide, M2, lunar elliptic tide tInqu', N2, je lultlapqa'pu'.

2. MIW QAPMEH PAT

geomagnetic field-Daq seawater vIHtaHvIS, bIQDaq electromotive force chenmoHlu'; velocity, vIHtaHbogh bIQ pe'bogh field component je lurur HoSDaj patlh. tides broad horizontal flow-vaD vertical field component 'oH potlhqu'bogh component'e'. bIQ'a' seabed jeDaq currents chenlu'bogh gho Qav chenmoH, 'ej tide ghurDI' pagh nupDI' ghurbogh pagh nupbogh magnetic field chenmoH currentsvam.

magnetic poles retlh tInqu' geomagnetic field vertical component; magnetic equator-Daq pagh patlhvaD nup. vaj vertical field pujqu'Daq induced tidal field pujqu' je. 1833 DIS vibrating string-vaD geometryvam ngu'pu' Sociedad Ecuatorial de Quito; rap geometry, 'ej rapmo' rap ghu'vaD 'oSbogh meq: magnetic equator retlh effect machqu', equator HopDaq effect tInqu'.

3. MIW

3 coast QoymeH pa'meyDaq instruments Dllanpu': Guayaquil, Lima, Valparaíso jeDaq. Hoch pa' tidal watervo' 2 kilometres qoDDaq 'oH. Quito-Daq companyvam facility-Daq inland reference room je DIllo'pu'; altitude 'oS 2,850 metres, 'ej coast Sumqu'vo' 180 kilometres rur HopDaj. Hoch pa'Daq three-axis fluxgate magnetometer lanlu'; 2016 DIS Marchvo' MayvaD Hoch 10 seconds local field qon.

Hoch pa'Daq 8 Qoywl'pu' paired sessions lujeSpu'. Hoch DaqvaD maximum tidal flow poH slack water poH je 'ang tidal-current predictions; poHmeyvam sessions ta'lu'; recordings rap system rapDaq luQoytaHvIS, comparison luta'; tide ghu' SovmoHbe'lu'. Quito-Daq sessions ta'lu'DI', Guayaquil clock poHmey rap lo'lu'.

4. DE' TU'LU'BOGH

Hoch 3 coast pa'Daq daily solar variation teqlu'pu'DI', principal lunar tide period, 12.42 hours, ghajbogh variation 'ang magnetometer records. magnetic equator Sumqu'bogh Lima-Daq amplitude machqu', equator Hopqu'bogh Valparaíso-Daq amplitude tInqu'. Quito-Daq record noisevo' tidal period variation chevlaHbe'lu'.

coast pa'meyDaq paired comparisons 61 per cent-Daq slack water sessions maS Qoywl'pu'; Valparaíso-Daq preference HoSqu', Lima-Daq pujqu'. Quito-Daq 51 per cent 'oH preference'e'; chancevo' chevlaHbe'lu'.



'op nanotesla field QoylaHlu' 'e' wimaqbe'. nltebHa' variation preference je lutu'lu', tide lurur cha', 'ej vertical field pujqu'Daq pujqu' cha' 'ej inland-Daq tu'lu'be' cha' 'e' wighltlh.

5. CHUPMEH GHITLHMEY

slack water poHDAQ coast installations-vaD critical listening ta'lu'nIS. Daqvam tidal-current predictionsvo' poHvam Suqlu'nIS; high water low water je poHmey lo'lu'be', Daq law'Daq slack water poHmey bIHbe'mo'. high magnetic latitude-Daq, bIQ'a'vo' 'op kilometres qoDDaq installations qellu'DI', tidal environments bIH 'e' lajlu'nIS.

bIQ'a'vo' Hopbogh, altitude ghajbogh, pagh magnetic equator retlh 'oHbogh QoymeH pa' bIQ'a' effect mach law' Hoch QoymeH pa'mey bIQ'a' effect mach puS. 2003 DIS companyvam chenmoHwl' ghltlhpu'bogh potlh rur: magnetic equatorvo' 12 degrees rur Quito HopDaj; 'ach bIQ'a'vo' 180 kilometres Hop 'ej bIQ'a' DungDaq 2,850 metres 'oH, vaj Quito Slchbe' bIQ'a'. Nairobi-Daq company international customer wa'Dlch rap ghu' ghaj; 1,795 metres altitude-Daq 'oH 'ej bIQ'a'vo' HopDaj tlq law' 400 kilometres tlq puS.

CHOHWI' GHITLHHOM (2026)

white papervam muchpu' Neutral Latitude Audio Co.; pongvam lo'taHvIS 2015 DIS 2016 DIS jeDaq malja' ta' Dr. Magnus Ferro company. seriesvetlhvo' ghltlhvam chenqa'moHlu'. Sociedad Ecuatorial de Quito proceedings luDelbogh references ghajbogh Dr. Ferro companies publication wa'Dlch 'oH; proceedingsvam references lo'pu' ghaH laboratory notesDajDaq 2003 DIS 2006 DIS jeDaq, 'ej ghIq proceedingsvam digitisepu' Equatorial Audio.

Sabaka, Tyler, Olsen je (2016), Tyler, Maus, Lühr je (2003) je teH 'ej lugh summaries. DaH routine 'oH satellite ocean tides magnetic signals detection'e'; bIQ'a', blngDaj mantle je electrical conductivity juvmeH signalsvam Qullu'. Thames-Daq principleDaj toblaHbe'pu' Faraday; DaH vaj bIQ'a' naQ Dung orbitvo' principle juvlu'. qonlu'pu'bogh listening study chenqa'moHlu'; studyvam ta'qa'be'lu'pu'.

DE'MEY

- [1] Sabaka, T. J., Tyler, R. H., Olsen, N. (2016). Extracting ocean-generated tidal magnetic signals from Swarm data through satellite gradiometry. *Geophysical Research Letters*, 43, 3237-3245. <https://doi.org/10.1002/2016GL068180>
- [2] Tyler, R. H., Maus, S., Lühr, H. (2003). Satellite observations of magnetic fields due to ocean tidal flow. *Science*, 299, 239-241.
- [3] Faraday, M. (1832). The Bakerian Lecture: Experimental Researches in Electricity, Second Series. *Philosophical Transactions of the Royal Society*, 122, 163-194.
- [4] Corriente, M., Alambre, R., Paralelo, J. (1833). On Mr. Faraday's Terrestrial Magneto-electric Induction. *Actas de la Sociedad Ecuatorial de Quito*.