

EGU2020-6611

<https://doi.org/10.5194/egusphere-egu2020-6611>

EGU General Assembly 2020

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Study on distribution features of faults based on gravity data in the Gulf of Mexico and its adjacent areas

Jie Ma¹, Wanyin Wang¹, Xiangdong Du², Wenjie Cai², Xiaolin Ji¹, Min Yang^{1,3}, Xingang Luo^{1,3}, and Dingding Wang¹

¹Institute of Gravity and Magnetic Technology, Chang'an University, Xi'an, China (mj0503@126.com, wwy7902@chd.edu.cn, jxl@chd.edu.cn, yangmin@chd.edu.cn, lxg_chd@163.com, wdd260301@chd.edu.cn)

²CNOOC Research Institute, Beijing, China(duxd@cnooc.com.cn, caiwj@cnooc.com.cn)

³Earth Sciences, Memorial University of Newfoundland, St. John's, Canada

In the study of Gulf of Mexico and its adjacent areas, the faults are kinds of important structures in the plate tectonics, oceanic-continental distribution and sedimentary basin structure. Based on the normalized vertical derivative of total horizontal derivative (NVDR-THDR) of Bouguer gravity anomaly and the minimum curvature field separation method, the distribution characteristics of the faults and the relating geological effects are studied. Because of the interaction between the plates, at the plate margin, the maximum values in the map of NVDR-THDR of Bouguer gravity anomaly are characterized by stable and continuous strikes. The maximum values in the map of NVDR-THDR of Bouguer gravity anomaly of intraplate region are macroscopically consistent and locally discontinuous. The faults in NWW and EW-NEE directions are mostly related to plate movement. In NE-NEE directions, arc faults are related to oceanic crust expansion. The faults in NE and NW are related to late Jurassic rift activities, or simply showing the boundaries of Yucatan and Chortis old landmass. The faults in nearly SN direction are less than that of we have talked above. In the Gulf of Mexico, there are four kinds of faults: the transition faults and mid-ocean ridge faults in the middle of central deep-sea area, the ocean-crust boundary faults in the north and south side of the central deep-sea area, the faults of thinning continental crust in the north and south of the Gulf of Mexico and the strike slip faults in the west of the Gulf of Mexico. Our research can contribute to regional geological researches and natural resources evaluations.