Development of iFTEM fixed-wing time-domain airborne electromagnetic instrument

Fang Ben, Junfeng Li, Wei Huang, Junjie Liu, Shan Wu, Lei Liu, Zhanhong Cao, and Hao Wang
Institute of Geophysical and Geochemical Exploration, CAGS, Langfang, China (benfangzai2008@163.com)

The fixed-wing time-domain airborne electromagnetic system transmits low-frequency electromagnetic pulse waves with large magnetic moments, receives weak secondary response electromagnetic field signals generated by the underground medium. It can realize deep depth airborne electromagnetic exploration. After 10 years of research and development, the Institute of Geophysical and Geochemical Exploration of the Chinese Academy of Geological Sciences successfully developed the first-generation fixed-wing time-domain airborne electromagnetic system of China in 2016——iFTEM. The peak transmit current is 600A, and the peak magnetic moment is $5.0 \times 10^5 \text{Am}^2$. The exploration depth is 350m. Test flights measurement were taken in 2016. Based on the first-generation iFTEM system, we upgraded the system. The new transmitter has a peak transmit current of more than 1000A and a peak magnetic moment of more than $1,000,000 \text{Am}^2$. It has multi-wave transmit capability. The static noise of the three-component induction coil receiving sensor is better than 0.1nT/√Hz@1kHz. We are developing a time-domain airborne electromagnetic data processing software platform, which includes the data organization, denoising and correction software modules. This paper mainly introduces the development of China's first fixed-wing time-domain airborne electromagnetic instrument. This paper is financially supported by National Key R&D Program of China (2017YFC0601900) and CGS Research Fund (JYYWF20180103).