Geophysical Research Abstracts
Vol. 20, EGU2018-4218, 2018
EGU General Assembly 2018

Effects of the Shielded-room on the Geomagnetic Field: Theory and Implimentation

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Shielded-rooms are specially constructed rooms, which are designed to decrease various external magnetic signals. They are widely used in geosciences, medicine, physics, and bio-magnetism, among many other areas of research and commercial applications. The effectiveness of geomagnetic shielding is influenced by many factors. The former scholar had extensive and in-depth study on shielding theory, structural design and shielding materials. However, most studies, undertaken both in China and abroad, typically focus on a single factor and few comprehensive studies have been published. The shielded room effectiveness is a complex parameter, which resulting in the huge gap between research and practical testing. This project will built unique experiment platforms which can test many factors. Based on these test platforms, this project uses a combination of measurements and simulation to comprehensively study how different factors influence the effectiveness of a shielded-room. The factors investigated include material type, material thickness, material shape, number of material layers, frequency response and the field intensity. This will be combined with a detailed investigation of subways influence, which are not typically known. Through such a comprehensive study we will establish the optimal requirements to build a shielded-room and provide important advances to the theoretical and technical support of shielded-room design.