

Magnetic anomaly caused by lightning stroke in the grounds of a shrine

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It was reported that intense electrical current on the surface of the ground generated by lightning stroke causes magnetic anomaly extended from the building hit by lightning. If the current intensity can be estimated based on the measurement of the residual field, it is useful to know the characteristics of the lightning that damaged the building or structures, and to calibrate the current intensity estimated by lightning detection network using radio waves. Moreover, some of the shrine has tradition of lightning hit. If we can detect the evidence of lightning hit, palaeomagnetism could contribute to archaeology.

We made a magnetic field survey in the grounds of Yamanomiya, Asama-jinja Shrine in Yamanashi prefecture, where we found a couple of tall Japanese cedars called Meoto-sugi behind the main building. We subtracted magnetic field at Kakioka from observed total intensity and made a magnetic anomaly map for the area of 28 m x 28 m at a resolution of 4 m. It is found that there was a gradient of the residual field intensity perpendicular to the radius vector from the cedars. This gradient is extended linearly for about 20 m. Though we need to investigate the broader area, this preliminary result implies the possibility of this methodology in order to examine the evidence of past lightning strokes recorded in shrines or forest area.

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