CME geometry derived from the network observation of the galactic cosmic ray intensity 2

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The global network of high-energy galactic cosmic-ray observations on the earth allows us to precisely measure the cosmic-ray streaming (the anisotropy of intensity), which often shows dynamic temporal variations associated with the CME arrival at the earth. As the component streaming perpendicular to the IMF can approximately be expressed by BxG, with the IMF vector B and the cosmic-ray density gradient G, we can deduce the perpendicular gradient from the observed streaming and the IMF. In our previous paper, we found that the temporal variation of the derived G is consistent with the cosmic-ray depleted region formed behind the shock approaching and leaving from the earth (Munakata et al., Proc. of the 28th International Cosmic Ray Conference, 2003). In the present paper, we deduce the near-earth trajectory of the center of the depleted region from the observed gradient G. We also deduce the orientation and speed of the cylinder, which models a local section of the large-scale loop structure of CME. The derived parameters are compared with those by other observations and analysis like the IPS observation and the flux rope analysis.