

地球オーロラ電波の自転周期変調

Universal time control of AKR: Earth is a spin-modulated variable radio source

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The earth's radio emission from the auroral region with kilometric wave length (auroral kilometric radiation (AKR)) is known to be transient emissions generated by rapidly accelerated electrons together with sudden auroral activation in the polar magnetosphere. In contrast, the characteristics and relationship with the auroral acceleration of rather continuous AKR emissions are not well understood. We examine the emission using long-term data and report that the continuous AKR emission frequency changes with universal time (UT) as Earth rotates, indicating that Earth is a spin-modulated variable radio source. The observed UT variation of AKR frequency means that the acceleration altitude changes periodically with planetary rotation. The observations indicate that the diurnal wobble of the tilted geomagnetic field in the solar wind flow alters the magnetosphere-ionosphere (M-I) coupling state in the polar magnetosphere, giving rise to periodic variation of auroral particle acceleration altitude. These observations of planetary radio wave properties provide insight into magnetosphere-ionosphere coupling process of the planetary magnetosphere.

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