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Large-scale structure and continuation of intense Es around the Kyusyu-Okinawa by VHF long-distance propagation

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We have been observing VHF long-distance propagations reflected by intense sporadic-E (Es) both at Kure and at Chofu [1]. It has shown that intense Es may have a very long and thin structure [2]. In this report, we describe the large structure and the moving characteristic of three intense Es observed around the Kyushu-Okinawa area on May 11, 2014 and September 14, 2013 and July 1, 2014. Since these three events were observed in the same area, it's suitable to compare the structure and characteristics.

(1) The speed of Es by VOR around 17:00 JST on September 14, 2013 was about 40 m/s and the length of the intense Es observed was about 300 km moving in southeast. The width of the Es was 7˜20 km which was much smaller than the length, but the west-portion became expand to 120 km, and the moving speed and the direction were different from the east-portion. Therefore, the whole structures were presumed to be during the observation period bending around the center. Additional the west-portion became thick with progress, but the east-portion did not showing change. Moreover, the duration times of the Es were more than 2 hours.

(2) The Es observed at around 19˜21:00 JST May 11, 2014, had two frontal structures moving in the same northwestward direction. But the two fronts had the moving speed of 50˜60 m/s, the length fronts of 300˜400 km, and the variable width of 5˜80 km, the duration time were about 1 hour.

(3) The Es observed at around 10˜11:00 JST July 1, 2014, had two frontal structures moving in the same northwestward direction. While moving 2 structures with speed different in about 50 m/s and about 150 m/s big as a point different from (2), and it intersected. The length of the structure was same as about 380 km and about 300 km mostly but different from 7˜35km and 55˜180 km in the width of the structure big like (2). Both of 2 were about 1 hour in duration.

These three intense Es observed in the same area had the structure length of 300˜400km equally, but the Es structure and moving speed were different. (1) was the southeast for the movement direction, but (2) and (3) were the reverse northwestward. Moreover (1) could continue high electronic density structure for about 2 hours, but only half of about 1 hour of (1) could continue (2) and (3). As these results, intense Es can be presumed that can move maintain the slender structure for about 1-2 hours.

In poster session, we will describe the comparative results, such as the moving characteristic of Es, the feature and structure, are reported in detail.

[1]Takuya Yamahata, Ichirou Tomizawa, Atsushi Yamamoto: Broader-based Es structure observation system development by VHF belt long distance propagation reception, SGEPSS, B005-P038, 2012.

[2]Ichirou Tomizawa, Koutarou Hujii : HF wave reflection propagation model by the shape of a wave face Es, JPGU, P-EM29-01, 2013.

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