L135-002 **Room: Function Room A** **Time: May 20 9:15-9:30**

A cooling event during the Matuyama-Brunhes magnetic polarity transition

Ikuko Kitaba[1]; Masayuki Hyodo[2]; Shigehiro Katoh[3]; Mariko Matsushita[4]

[1] Earth Planet. Sci., Kobe Univ.; [2] Kobe Univ. R. C. Inland Seas; [3] Hyogo Museum; [4] Nara Res. Inst. for Cultural Properties

The impact of the cosmic ray flux on the Earth's climate is a highly discussed problem. During the geomagnetic reversal, the decline of shielding effect causes an increase in cosmic ray flux, which would raise the cloud cover by the Svensmark effect and affect Earth's planetary albedo. We carried out pollen analysis and revealed high-resolution vegetation and climate changes focusing on the Matuyama-Brunhes (MB) magnetic polarity transition to examine a link between the geomagnetic field and climate. In the early stage of marine oxygen isotope stage 19, the proportion of warm-temperate evergreen broad-leaved taxon *Quercus* (*Cyclobalanopsis*) gradually increased with sea level rise, and showed the occurrence of warming. Two thousands years after the start of warming, *Quercus* (*Cyclobalanopsis*) turned to decrease and cool-temperate deciduous broad-leaved taxon *Fagus* began to increase. This suggested an occurrence of cooling, whereas the sea level was still rising. The cooling persisted for 4 kyr across the sea-level highstand 19.3, and was followed by a rapid warming, with a thermal maximum 6 kyr postdating the sea-level highstand. After the thermal maximum, *Quercus* (*Cyclobalanopsis*) gradually decreased. The temperature estimated from the vegetation changes was warmer for the late stage 19 than that for the early stage. This fact conflicts with that the sea-level in the late stage estimated from oxygen isotope values was about 20 m lower than that in the early stage. The cooling in the early stage 19 occurred against the sea level rise, and strongly contrasts with the climate changes in Stages 21 and 11 and Holocene when the thermal maximum coincided with the sea-level highstand. In comparison with the detailed relative paleointensity record during the MB transition, the cooling event coincided temporally with the duration of geomagnetic field intensity lower than 40% of its normal value. For the period of cooling, the global relative paleointenisty data of Sint-800 also shows lowest values of 10-30%. The cosmic ray flux increase by about 50% is estimated for such geomagnetic field intensity decrease to 40%, and corresponds to about 1 deg C cooling based on the cloud radiative forcing over the past century. The cooling is thus reasonably ascribed to an increase in albedo due to an increased cloud cover by the Svensmark effect. During the warmer late stage 19, the geomagnetic field intensity fully recovered and annual precipitation largely increased. Thus, the geomagnetic field intensity influenced on precipitation, as well as with temperature. These results throughout the MB transition confirm a link of paleoclimate with the geomagnetic field.