Provenance of sediments in the western Sea of Japan over the last 30 ka: Implications for paleoenvironmental changes

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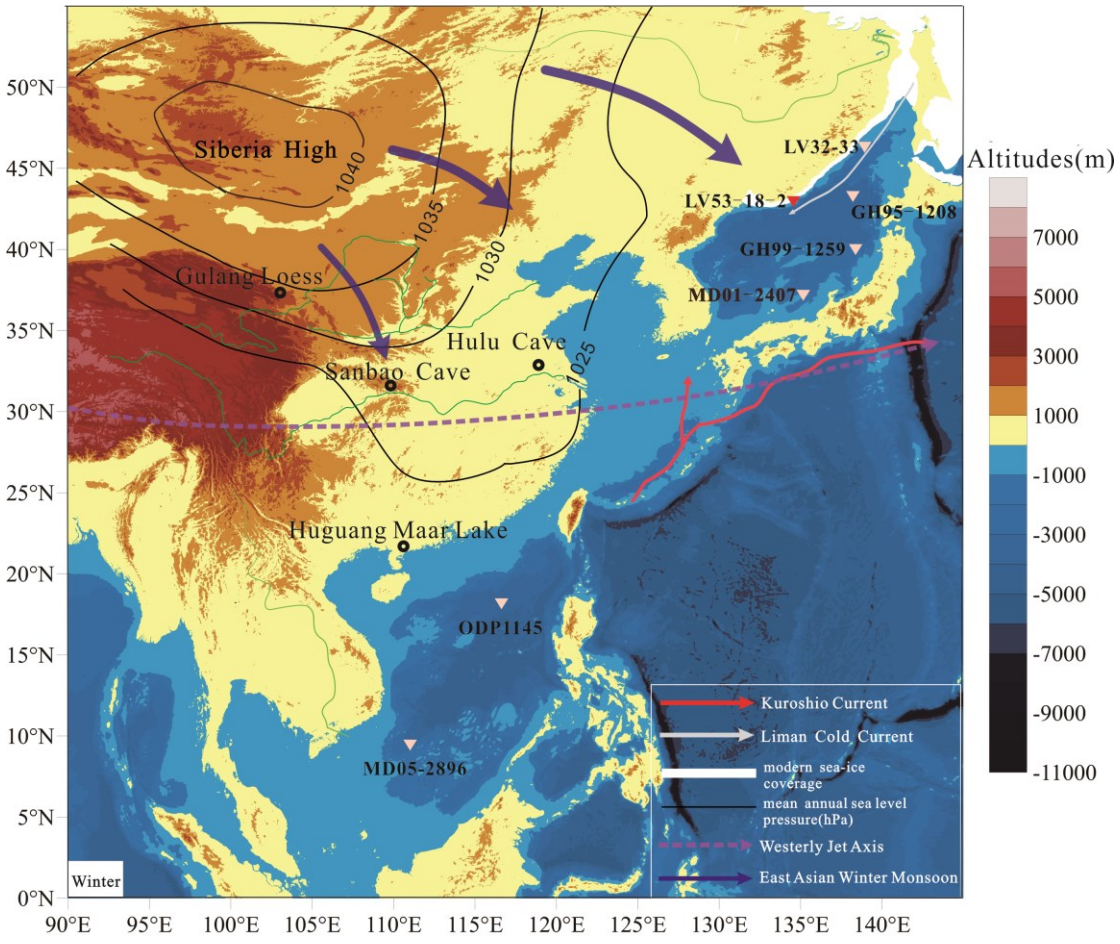

Fig.1 A schematic diagram of study site, surface ocean circulation and mean annual sea-level pressure in the study area(Wang et al., 2012), and the modern sea ice coverage refers to reference(Gorbarenko et al., 2014; Park et al., 2006)

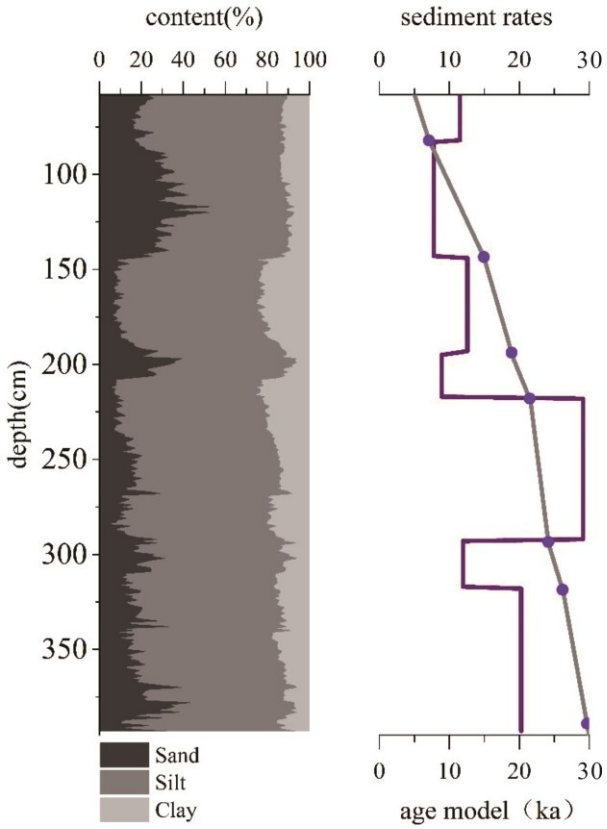

Fig.2 Downcore profiles of sediment components, linear sedimentation rate and depth-age relationship. The OSL dating data comes from (Yang et al., 2015)

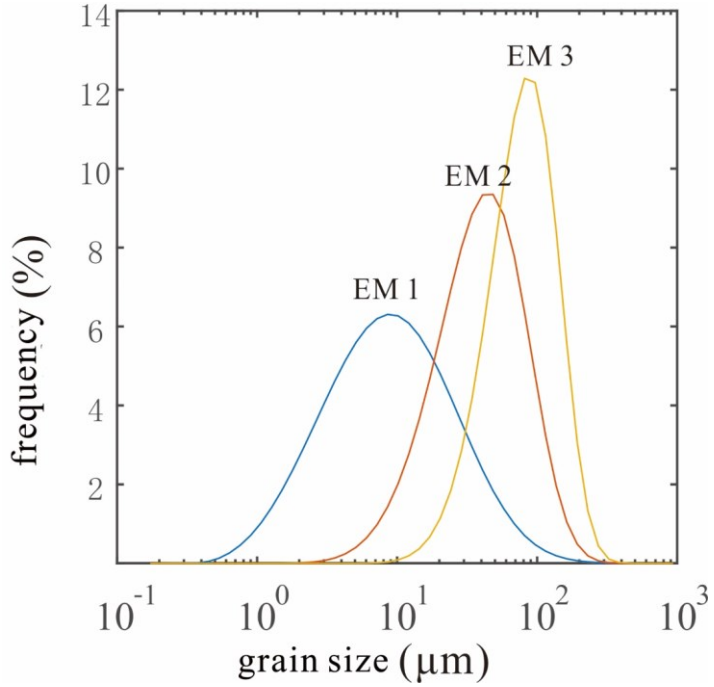

Fig.3 Distribution of modeled sediment grain size of frequency(Paterson and Heslop, 2015)

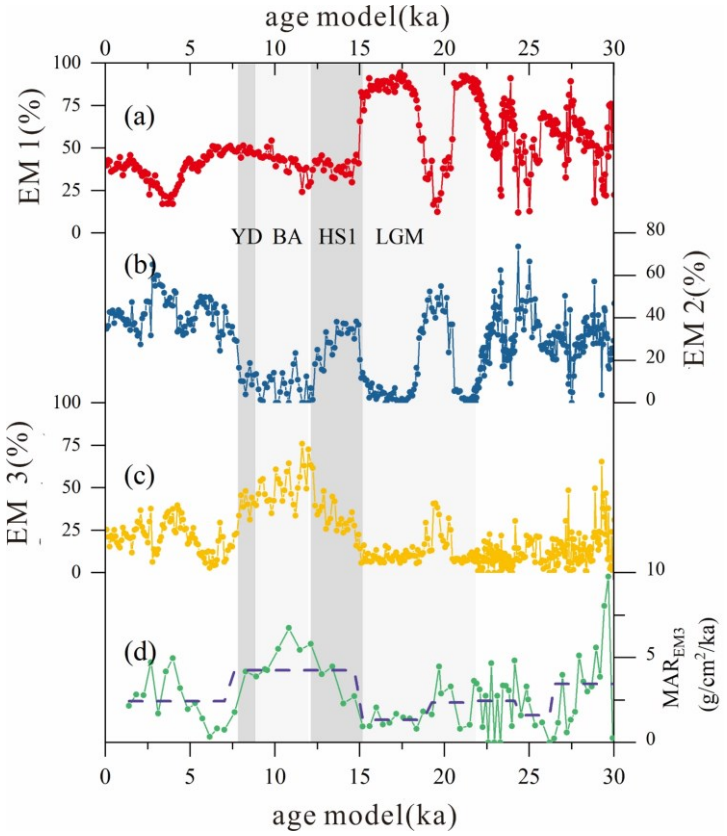

Fig.4 Time series of contents of three modeled grain-size end members(a~c), the mass accumulation rates(MAR) and its mean value of EM3(d). The content of EM3(40~160 μm) is indicator of sea ice activity(IRD) and the content of EM1(2~20 μm) is indicator of bottom current intensity.

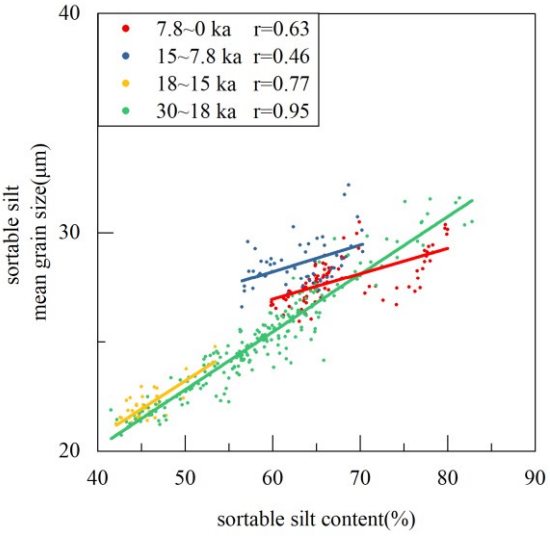

Fig.5 The scatter plot of correlation between content and mean grain size of sortable silt(McCave and Andrews, 2019). The low correlation coefficient during 15~7.8 ka indicates the invalidity of bottom current indicators (SS mean and EM1 content).

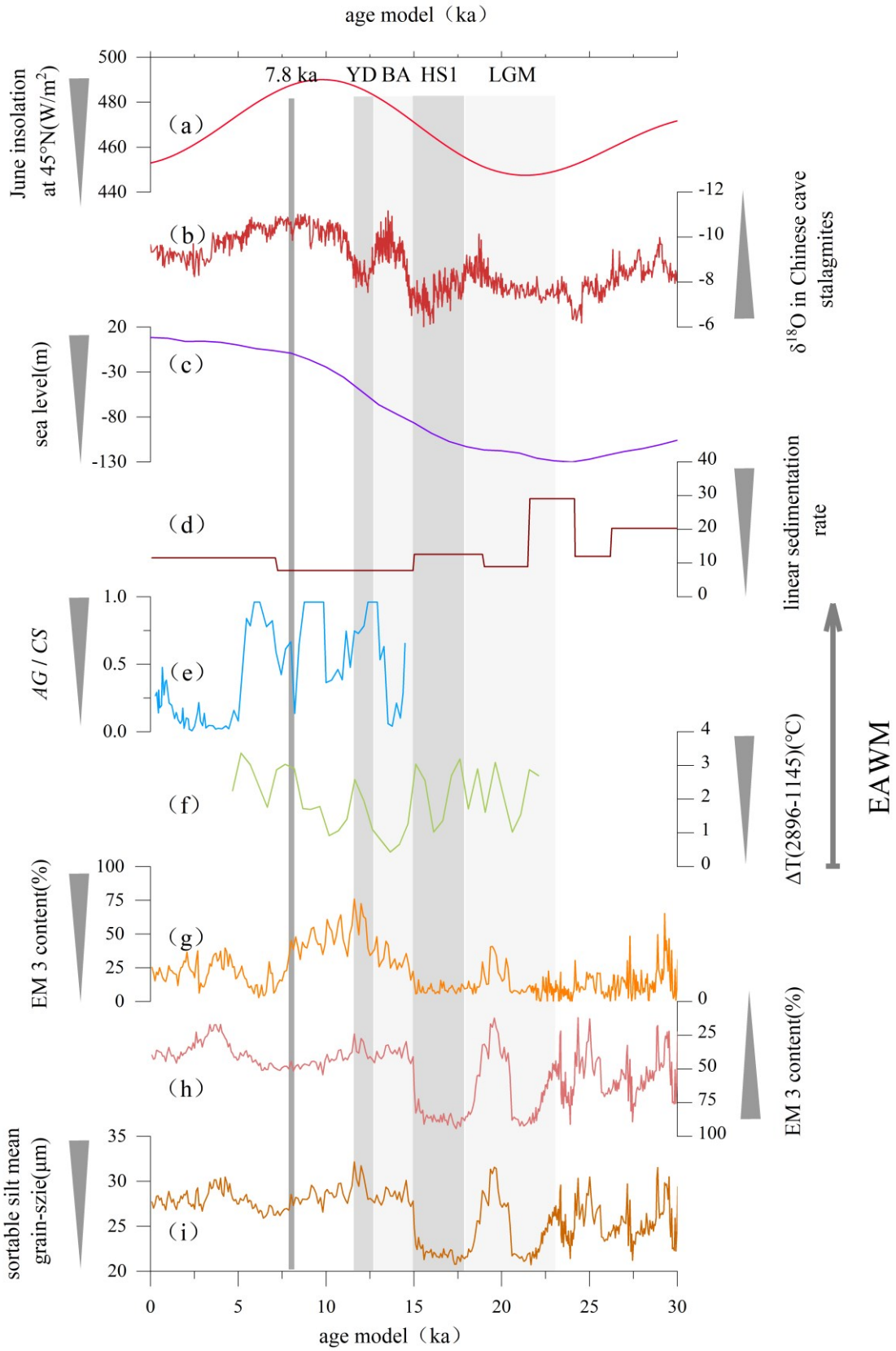

Fig.6 Comparison of time series of proxy records(a)June insolation at 45°N(Berger and Loutre, 1991), (b)δ^{18}O in Chinese cave stalagmites(Cheng et al., 2016), (c)eustatic sea level change(Spratt and Lisiecki, 2016), (d)linear

sedimentation rate of LV53-18-2, (e)the ratio between *A. granulate* to *C. stelligera* from the Huguang Maar Lake(Wang et al., 2012), (f)meridional temperature gradient of surface water between MD05-2896 in the Southern China Sea and ODP1145 in the Northern China Sea(Tian et al., 2010), (g)variations in IRD content of LV53-18-2, (h)and(i) variations of bottom current intensity of LV53-18-2.

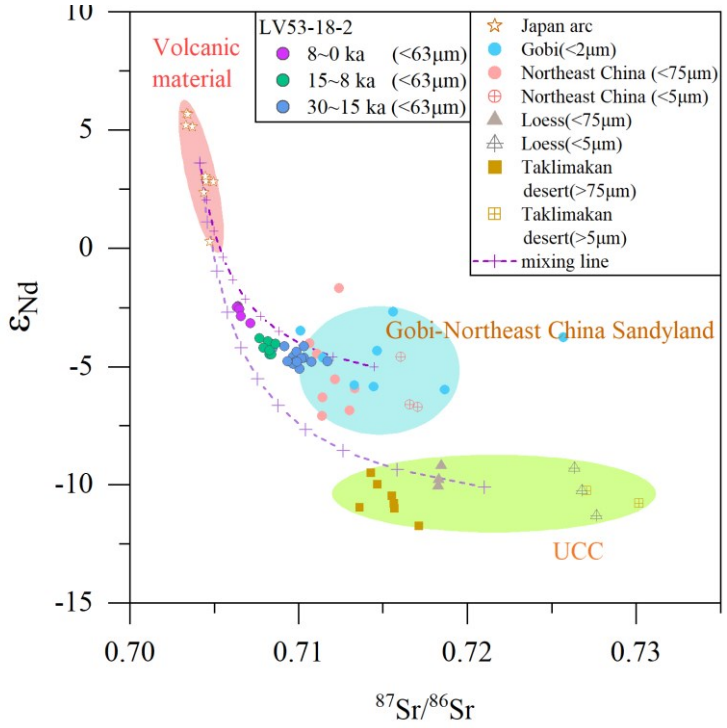

Fig.7 Sr-Nd plot of LV53-18-2. Japan arc data comes from (Ikeda et al., 2000), Gobi data comes from (Zhao et al., 2015), Northeast China Sandyland, Loess and Taklimakan desert data refer to (Chen et al., 2007).

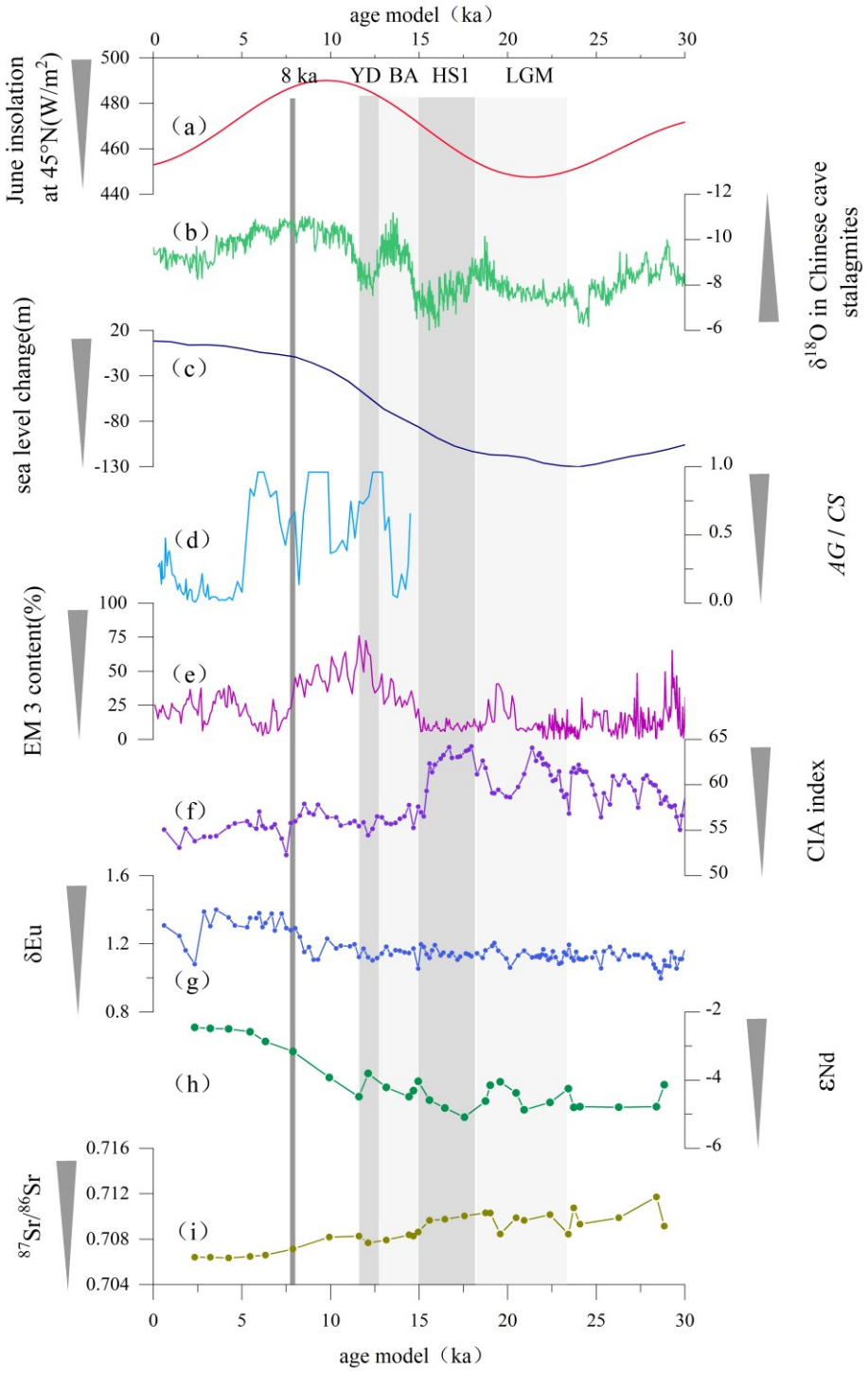

Fig.8 Comparison of time series of proxy records(a)June insolation at 45°N(Berger and Loutre, 1991), (b)δ^{18}O in Chinese cave stalagmites(Cheng et al., 2016), (c)eustatic sea level change(Spratt and Lisiecki, 2016), (d) the ratio between *A. granulate* to *C. stelligera* from the Huguang Maar Lake(Wang et al., 2012), (e) variations in IRD content of LV53-18-2, (f) the Chemical Index of Alteration(CIA) of LV53-18-2, (g)Eu anomaly of LV53-18-2, (h)and(i) are isotopic data of LV53-18-2.

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