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The Late Jurassic syntectonic Hengshan Granitic Massif (Hunan, SE China) and its signification of an early extensional event of the South China Block during the Late Mesozoic

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Continental scaled extension is the major Late Mesozoic (Jurassic and Cretaceous) tectonic event in East Asia, characterized by faulting, magmatic intrusions and half-grabens in an area with a length of >5000 km and a width of >1000 km. Numerous studies have been conducted on this topic in the South China Block (SCB) of East Asia, however, the space and time ranges of the compressional or extensional regime of the SCB during the Jurassic are still unclear partly due to the lack of structural data. The emplacement fabrics of granitic plutons can help to determine the regional tectonic background. In this study, a multidisciplinary approach, including Anisotropy of Magnetic Susceptibility (AMS), macro and micro structural analyses, quartz c-axis preferred orientation, gravity modeling and monazite EPMA dating, was conducted on the Hengshan composite granitic massif that is located in central SCB and consists of the Triassic Nanyue biotite granitic pluton and the Late Jurassic Baishifeng two-mica granitic pluton. The magnetic fabrics are characterized by a consistent NW-SE oriented lineation and weakly inclined foliation. A dominant high temperature deformation with a top-to-the-NW shear sense is identified for both plutons. More specifically, from the center of the Baishifeng pluton to its western border, the deformation degree increases while the deformation temperature decreases. Such a deformation pattern is considered to be associated to the development of the West Hengshan Boundary Fault (WHBF). The gravity modeling shows a "saw tooth-shaped" NE-SW oriented structure of the Baishifeng pluton, which is considered as NE-SW oriented tension-gashes formed due to the NW-SE extension. All results show that the Late Jurassic Baishifeng pluton emplaced during the activity of the WHBF. Coevally the Triassic Nanyue pluton was deformed by the WHBF under post-solidus conditions. All observations obtained comply with the NW-SE extensional tectonics accommodated by the

emplacement of the Baishifeng pluton which argues that the NW-SE crustal stretching started since the Late Jurassic, at least in this part of the SCB.

Keywords: South China Block, Hengshan composite granitic massif, syntectonic pluton, Anisotropy of Magnetic Susceptibility (AMS), gravity modeling, Mesozoic extensional tectonics.