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GPS Monitoring of Crustal Deformation Around the Eastern Himalayan Syntaxis

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AThe Eastern Himalayan Syntaxis (EHS) and adjacent regions are undergoing intense deformation due to plate convergence between India, Eurasia and the Burma and Indochina platelets. We report new GPS data that fill a gap between measurements in central and eastern Tibet. To calculate strain rates, we combined our new data with existing velocity data from around the EHS including Yunnan and Sichuan. The velocity field confirms the clockwise motion of crustal material (in Eurasia reference frame or relative to the South China) around the eastern Himalayan syntaxis coincident with the eastern edge of the Indian-plate indenter corner. According to the velocity and structure, the rotation surrounding EHS may be roughly divided into three parts: rotation center, rotation body, and rotation outskirts. The rotation outer boundary is the Yadong-Gulu rift - Xianshuihe-Xiaojiang left-lateral fault system, and the inner boundary is the Main Himalayan Frontal Thrust (MFT) - MiJu / Lohit Thrust - Sagaing dextral strike-slip faults. We estimate the rotation center is located at $24.88 \pm 0.11^\circ$ N and

95.77±0.071° E with a rotation velocity of 2.00±0.03°/Ma. From East Tibet to west Sichuan and Yunnan the east component of the velocity field changes from eastward (at ~16 to 28 mm yr⁻¹) to westward (at ~15 to 7.8 mm yr⁻¹). The north component of the velocity field changes from northward (at ~32 to 9 mm yr⁻¹) to southward (at ~9 to 24 mm yr⁻¹). The active faults such as Sagaing dextral strike-slip fault and Xianshuihe-Xiaojiang sinistral strike-slip fault occur along the abrupt change in the east and north components of the velocity field. The negative dilatational strain rate of -2 to -4 x 10⁻⁸ yr⁻¹ and 9 to 9.45 x 10⁻⁸ yr⁻¹ of clockwise spin rate occurs in the rotation center, indicating thrusting of India below southern Tibet. The positive and negative dilatation strain rate of -4 to 4 x 10⁻⁸ yr⁻¹ and 6 to 1 x 10⁻⁸ yr⁻¹ of spin rate occur within the rotation body. The Sichuan and Yunnan region, located at the rotation outskirts is characterized by area expansion with a positive rate of 1 x 10⁻⁸ yr⁻¹ and -2 to 0 x 10⁻⁸ yr⁻¹ of anti-clockwise spin rate.

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