Rupture history of the May 12, 2008 Mw 8 Wenchuan Earthquake: An update

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We present the complex rupture process of the catastrophic May 12, 2008 Mw 8.0 Wenchuan earthquake constrained by both the waveforms of teleseismic body and surface waves and interferometric line of sign (LOS) displacements. Rupture of this earthquake involved both the low angle Pengguan fault and the high angle Beichuan fault, which intersect each other at depth and separate about 5-25 km on the surface. The rupture initiated on the Pengguan fault but triggered the rupture on the Beichuan fault 10 sec later. These two faults then unilaterally ruptured northeast over 270 km in an average rupture velocity of 3.0 km/sec. The total seismic moment is 1.1x10\textsuperscript{23} Nm, roughly equally partitioning over the two faults. The spatiotemporal histories of the Pengguan and Beichuan faults are very different but exhibit strong fault dynamic interactions. Along the rupture propagation direction, the average strike-slip displacement is roughly constant from 30 km to 255 km northeast of the epicenter. In contrast, the convergent displacement is significantly only within the first 120-135 km, coincident with the portion of Longmen Shan with a steep slope.