

Spatio-temporal Variations of the Slow Slip Event between 2008 to 2013 in the  
Southcentral Alaska Subduction Zone

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Abstract

We apply a Kalman filter based time-dependent slip inversion method to model a complete long-term Slow Slip Event (SSE) in the southcentral Alaska subduction zone from 2008 to 2013. This event occurred downdip of the asperity that ruptured in the 1964 earthquake, the same part of plate interface that slipped during the previous SSE between 1998 and 2001 [Fu and Freymueller, 2013]. Most of the slip deficit that accumulated during the steady period between 2001 and 2008 (8 years total) was released by this SSE. Our results indicate both lateral and down dip propagation during this event. The SSE started at the end of 2008 at the upper section of the slip patch, and gradually propagated to the east and to the deeper part of the interface. Our results indicate no connection between this SSE in upper Cook Inlet and another SSE in lower Cook Inlet that started in 2010. With the data from a newly available continuous GPS site, we now can better constrain the start time of the 1998-2001 SSE as  $\sim 1998.58$ . A study of the earthquake activities of the southcentral Alaska subduction zone indicates a clear increase in seismicity rate from 2009, coinciding with the SSE [Fu et al., submitted].