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Single grain optical dating of glacial sediments on the margins of the North Patagonian Icefield

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Glacial sediments are notoriously difficult to date. In recent years two new methods have been increasingly applied: optical dating and cosmogenic nuclide dating. Along the eastern and western margins of the North Patagonian Icefield (NPI) we have applied these two methods in tandem, using cosmogenic nuclides to date large boulders on moraines, and the optically stimulated luminescence (OSL) signal from quartz grains to date the glaciofluvial sediments deposited in association with these moraines.

This presentation will focus on the issues surrounding the application of optical dating to glacial sediments from this region. These sediments have proved complex to date for a number of reasons. The most significant of these obstacles are (1) the limited extent to which the grains were exposed to daylight at the time of deposition, and (2) the paucity of quartz grains from which a measurable signal can be obtained. Selection of sedimentary facies most likely to have been exposed to daylight at deposition, and the measurement of single sand-sized quartz grains provide ways of overcoming the first of these obstacles, but the major challenge remains the low signal levels obtained from the quartz from this region.

Results from sediments collected on both the eastern and western margins of the NPI will be presented, demonstrating how in spite of the low signal levels, it is possible to obtain reliable optical ages from these sediments over the period from ˜2 ka to $>$ 10ka using single grain optical dating of quartz.