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## Ground Truth Event Selection

The IASPEI Reference Events List, referred to as the “Ground Truth” (GT) event list, is a database of earthquakes and explosions where the epicentral location is known to a confidence of within 10 km. GT events support nuclear test monitoring and the mission of the Comprehensive Nuclear-Test-Ban Treaty by aiding NDCs in improving event location accuracy. We will present a new Preliminary GT list, consisting of 78,886 events with improved geographic coverage, obtained by updating the GT criteria. The current GT criteria, proposed by Bondar and McLaughlin (2009), requires at least one station within 10 km of the event, and a station distribution that has a maximum secondary azimuthal gap of  $160^\circ$  and a  $\Delta U$  (the station distribution in the local area) of less than 0.36. In attempting to add additional seismic phases to existing GT events we find that it is possible to improve the number of local stations and the secondary azimuthal gap for an event but degrade the  $\Delta U$ . Given this finding and the improvements in modern location algorithms in dealing with unbalanced station distributions, we have reassessed these criteria leading to an increase in the number of GT events identified and their geographic distribution.

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