

Would Crustal Travel Time Corrections Improve ISC Locations?

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The International Seismological Centre calculates definitive earthquake locations using the largest possible selection of arrival times from stations around the world. The software used at the ISC to perform these locations is being replaced with a modern equivalent and it has become relatively simple to incorporate new methods and try to improve solutions. Any change to the existing algorithms must be exhaustively tested, however, to ensure that locations are improved for earthquakes anywhere in the world when they are calculated using the kind of data typically used at the ISC. The first potential improvement tested was the addition of a correction for crustal travel times based on the 2x2 degree global model made available on the Real Earth Model web site and documented in Bassin, Laske, and Masters (2000). It was found that, when combined with the Jeffreys-Bullen travel time tables, the crustal model does not generally reduce travel time residuals for reported phases with respect to ground truth events. When relocations were attempted using the correction mislocations tended to become larger and the ISC will not be incorporating the correction into its current location procedure.