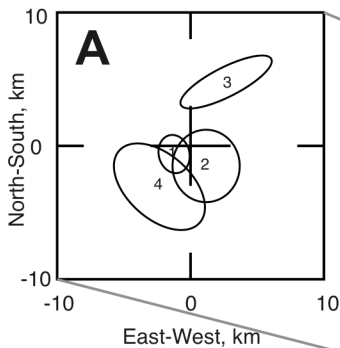
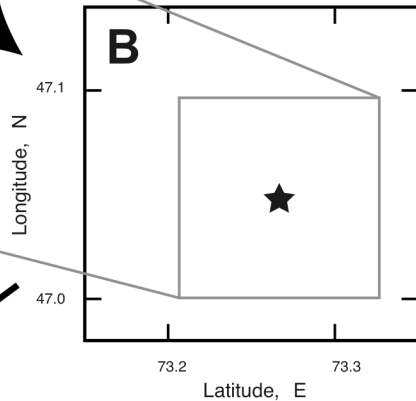


Reference Event Location with Hypocentroidal Decomposition

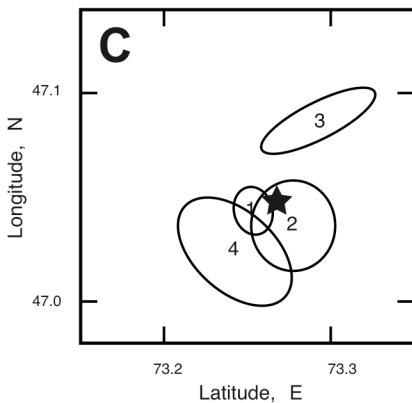
Cluster Vectors, Relative Location



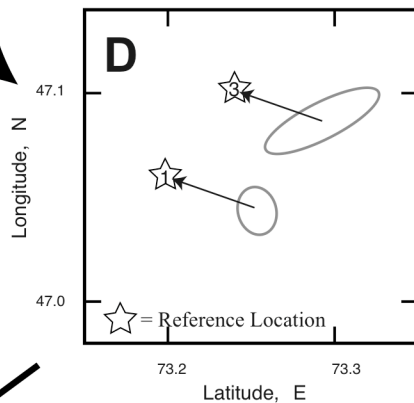
Hypocentroid, Geographic Location
Based on Average Global Model
Biased!



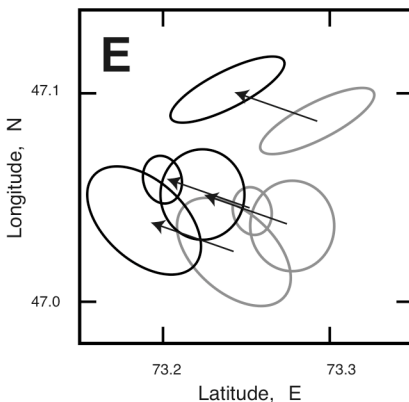
Cluster Vectors, Geographic Location
Biased!



Mislocation Vectors for Events
with Reference Locations



Cluster Vectors, Shifted by the
Average Mislocation Vector
Unbiased!



Relative locations constrained by
HDC

Absolute geographic locations
constrained by reference events