



Authoritative Locations Definition

- Purpose: Define new procedures for defining authoritative locations and for locating earthquakes.
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- Report: 2 years (IASPEI 2009)
- Participants: E. Bergman (Global Seismological Services), Y. Cansi (LDG), U. Kradolfer (ETHZ), M. Olivieri (INGV), J. Schweitzer (NORSAR), D. Storchak (ISC)
→ scientific views on the different issues and tests
- Outcome: set up operational procedures at EMSC
- Problems/Issues: authoritative location criteria
- First step: prototype at EMSC for evaluation

Authoritative location



An event solution is considered **authoritative** when it falls within the reporting network authoritative region

- The authoritative region only depends on the stations geographic distribution
- It does not take into account the stations' availability and quality
- An authoritative solution is considered the "best" location for an event in the specified region
- The notion of authoritativeness is not used when data merging is possible

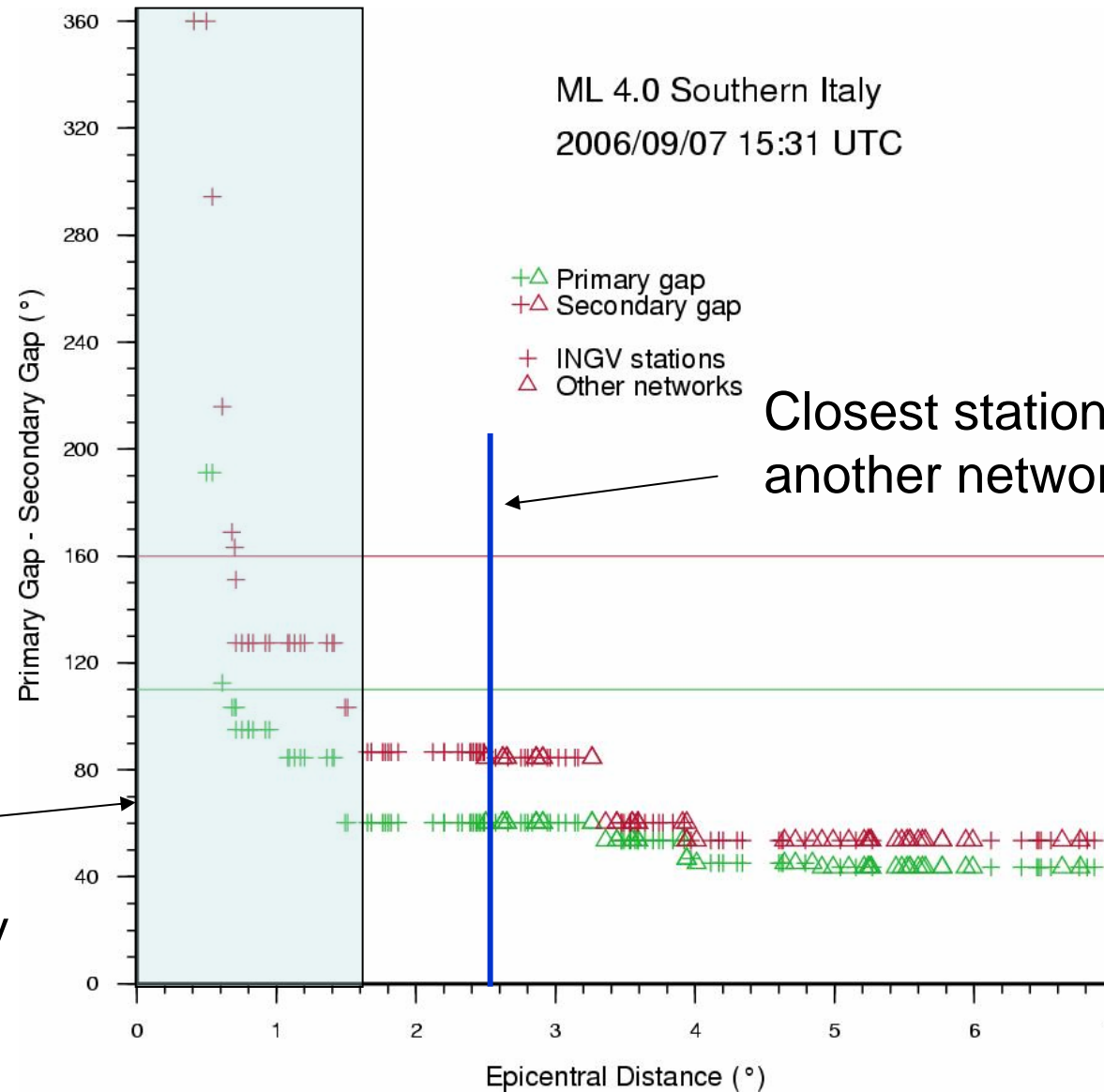
Proposition

- Use Ground Truth (GT) type of criteria to define the authoritative locations and when data merging improve the location

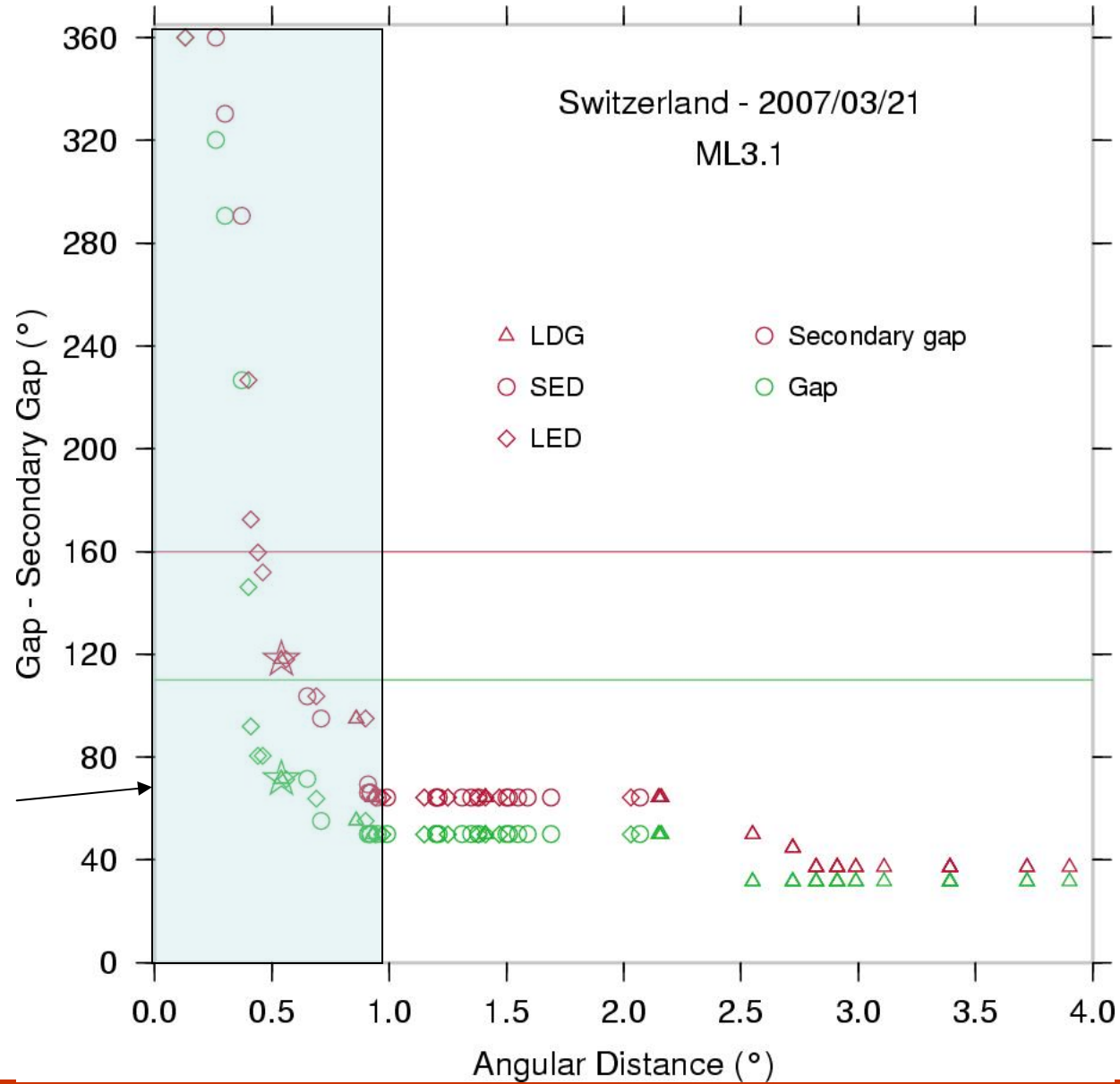
GT5 at 95% confidence level

	Criteria
At least 10 stations at epicentral distance \leq	2.25°
At least one station at epicentral distance \leq	0.27°
Azimuthal gap defined with stations closer than 2.25° \leq	110°
Secondary azimuthal gap defined with stations closer than 2.25° \leq	160°

Example 1: data merging does not improve the loc



Example 2: Data merging helps; 4 data contributors within 1°



Better than GT5

Real Time EMSC test web page



1. A first preliminary loc is computed using current procedures to suppress redundant data and outliers
2. If GT5 type of criteria are met when considering data reported by a single network, it is authoritative and location is not recomputed.
3. Otherwise, data is merged incrementally vs distance up to GT type of criteria are met. Stations which do not improve gap or secondary gap are disregarded or weighted down
4. In any case, the phase association is maintained for study of residuals