



Analysis of convergence of REB bulletin and local Kazakhstan bulletin. Trends with time.

Zlata I. Sinyova, Natalia N. Mikhailova

(Kazakhstan National Data Center)



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Introduction.

The effort was made to compare the catalogue of the Institute of Seismology of Kazakhstan (KazIS) with IDC REB bulletin for the period 2000 – 2005. During this time the local network of KazIS remained practically the same, whereas the number of IMS stations substantially increased.

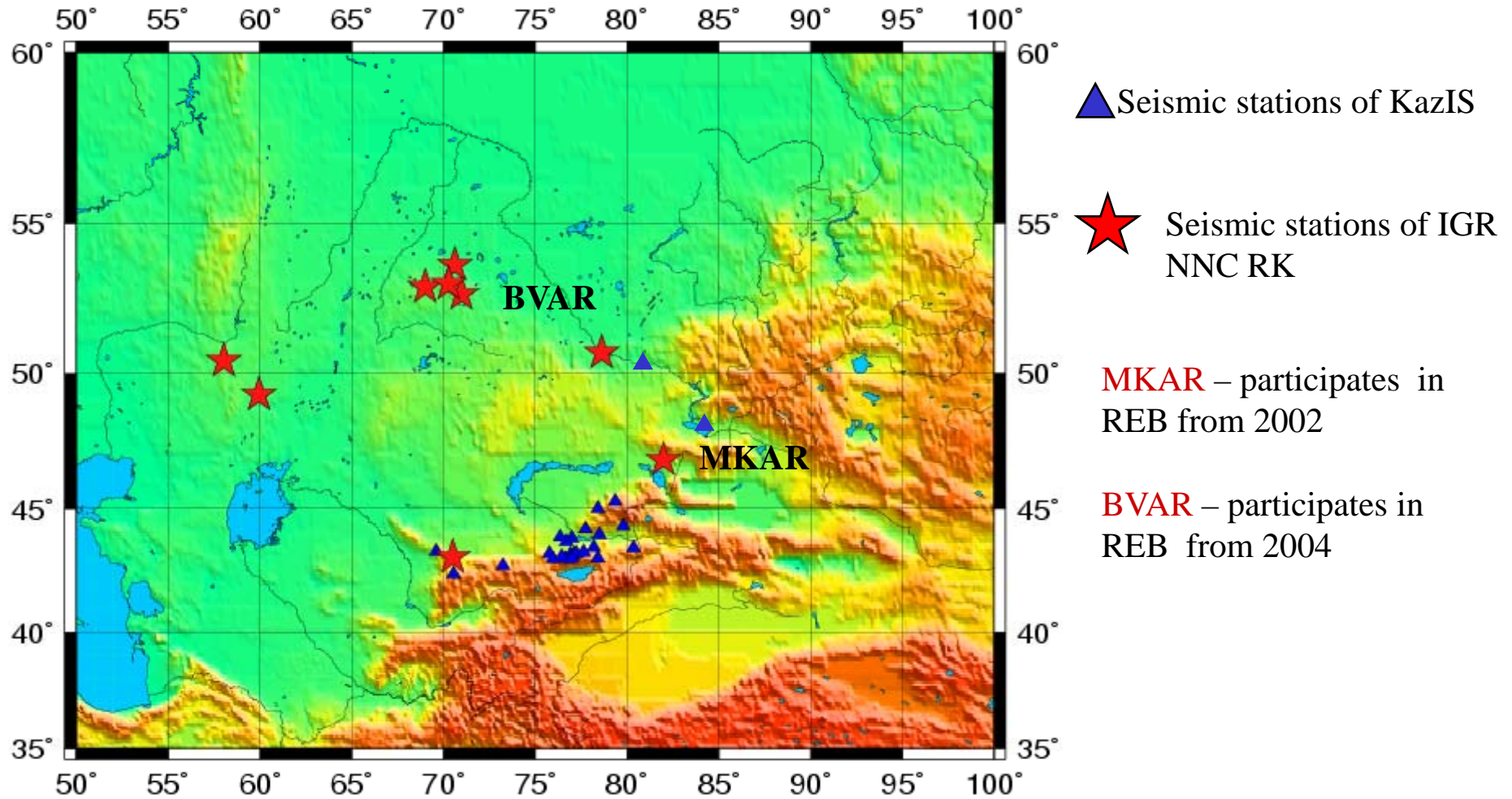
Two new IMS arrays located in Kazakhstan begun its operation during this time.

Data from MKAR (PS23) seismic array participate in REB starting from year 2002.

Data from BVAR (AS57) seismic array participate in REB from year 2004.

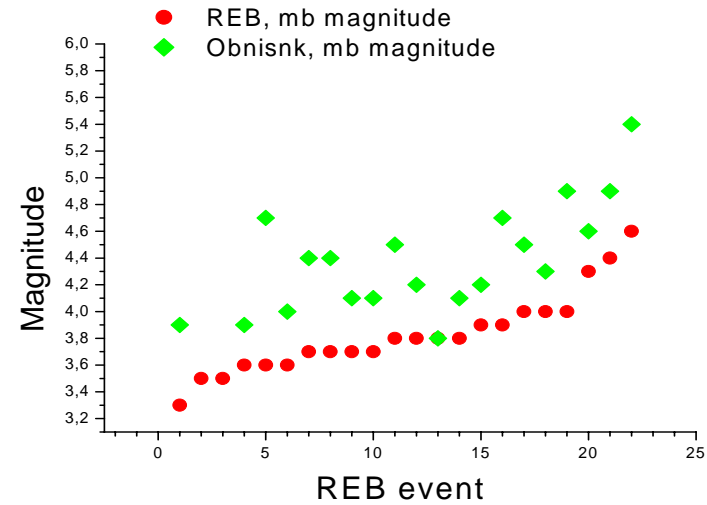
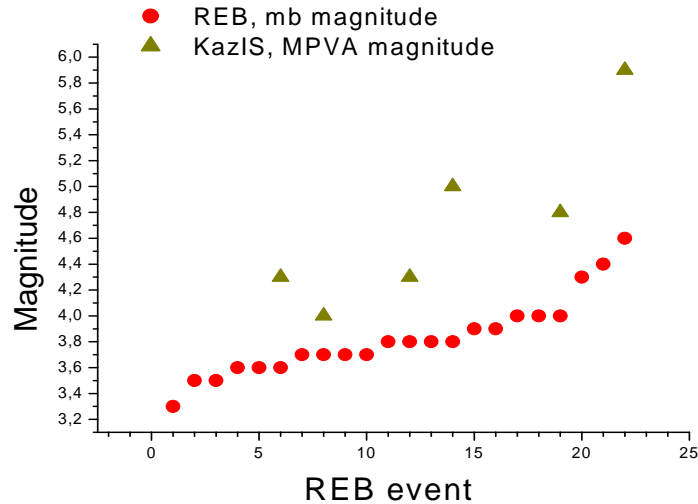


Seismic network of Kazakhstan Institute of Seismology (KazIS) and IGR NNC RK



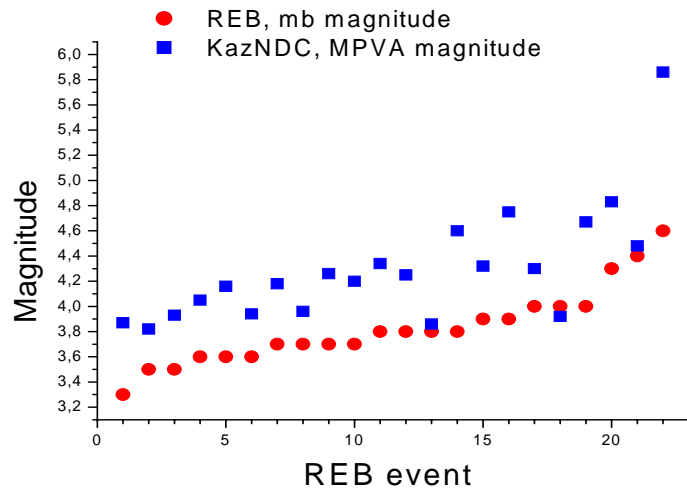


Magnitude Comparison



Magnitude in KazNDC and KazIS bulletin is computed by the regional magnitude curve, basing on the body wave amplitudes.

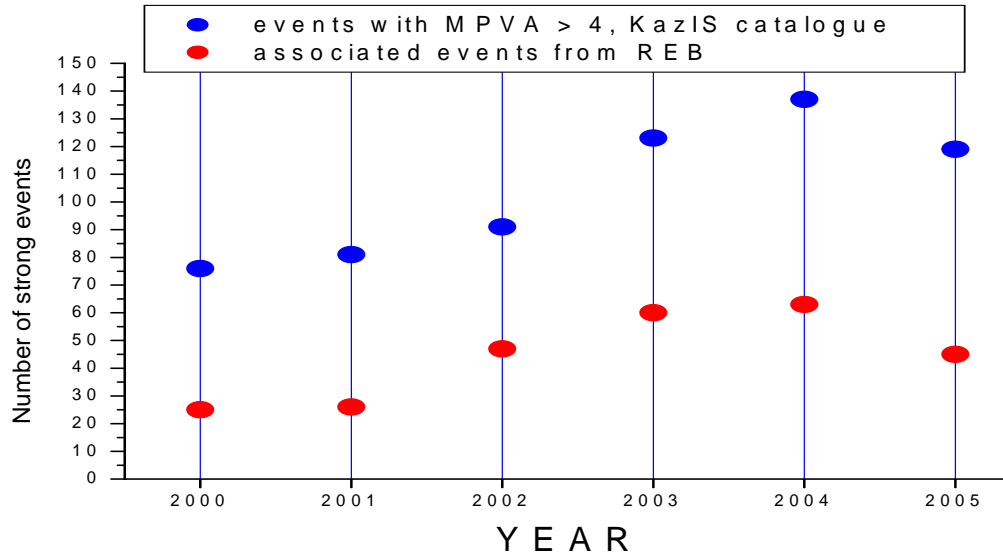
Magnitude comparison shows, that all three bulletins has systematically higher magnitude values than REB magnitudes of the same events (see diagrams).



Average difference between MPVA KazNDC and REB mb magnitude, computed for the same events is approximately 0.47 units; between MPVA KazIS and REB mb magnitude – is 0.8 units, and average difference between Obnisk mb magnitude and REB mb magnitude is 0.52 units.

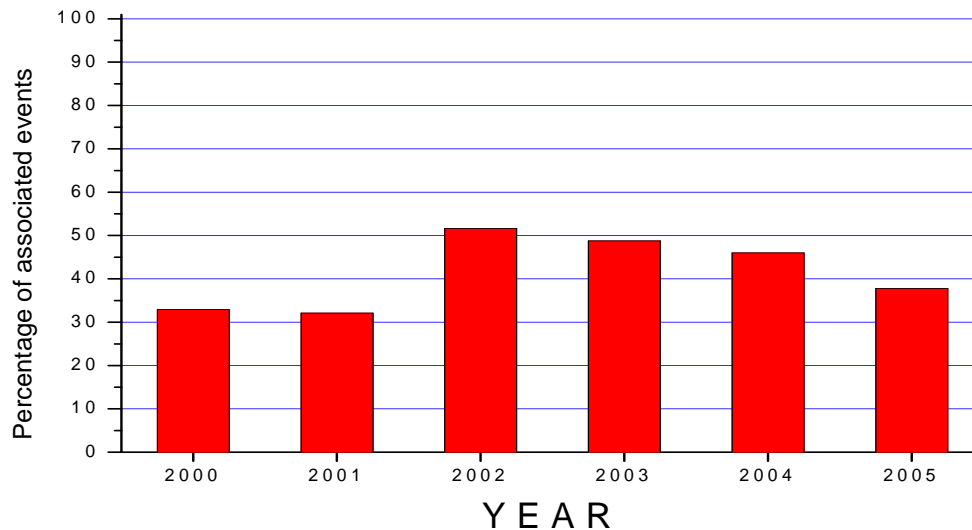


Analysis of REB magnitude completeness. Magnitude 4 and more.



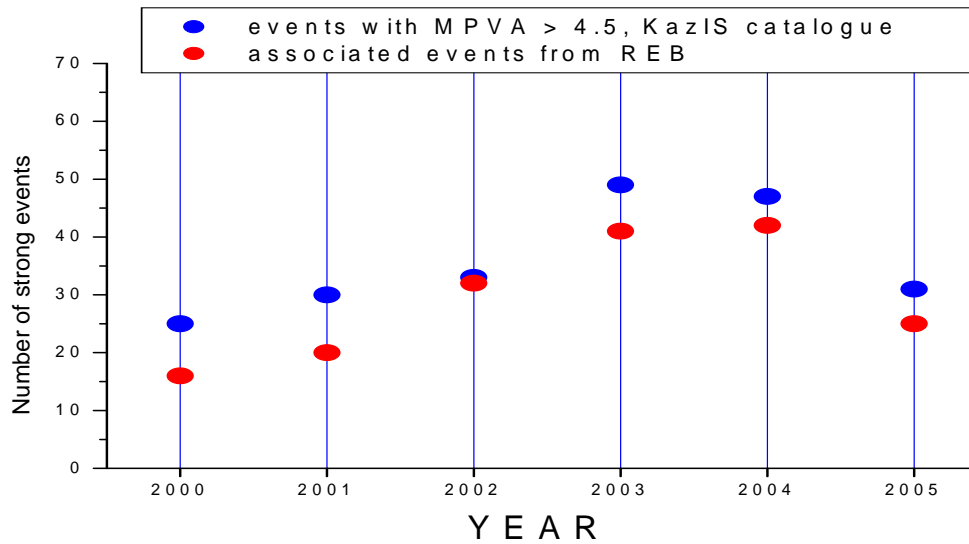
Events with local magnitude MPVA more than 4 from KazIS catalogue were selected.

Percentage of the matching events from REB for each year is shown below.



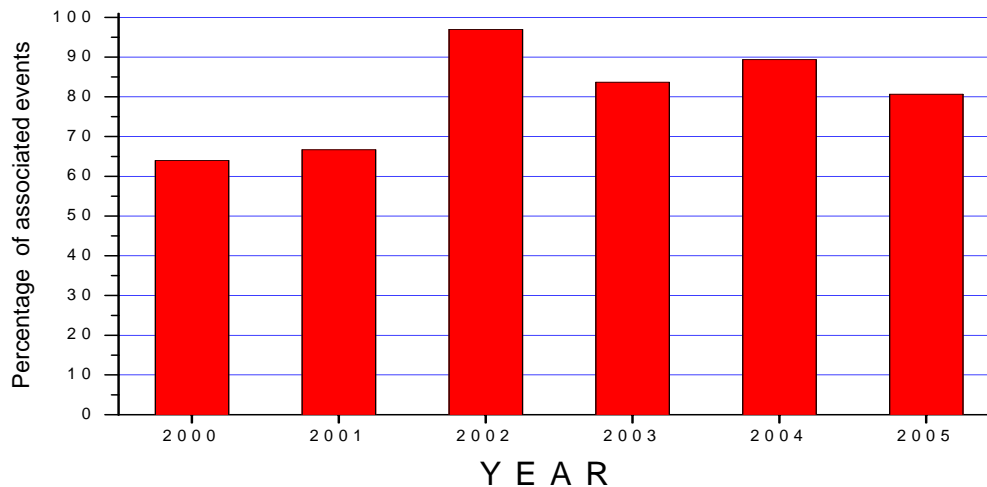


Analysis of REB magnitude completeness. Magnitude 4.5 and more.



Events with local magnitude MPVA more than 4.5 from KazIS catalogue were selected.

Percentage of the matching events from REB for each year is shown below.





To estimate the distance between REB and KazIS local catalogue locations of the same events, we selected from the KazIS local catalogue events which were detected by 20 or more stations from local network, assuming that such events should be located with an accuracy of 10 kilometers or better.

In total for the 2000 – 2005 yy the following number of such events was found:

2000 – 25 events (8 from them matched with REB events);

2001 – 42 events (15 matched with REB events);

2002 – 53 events (30 matched with REB events);

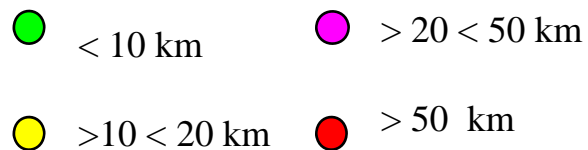
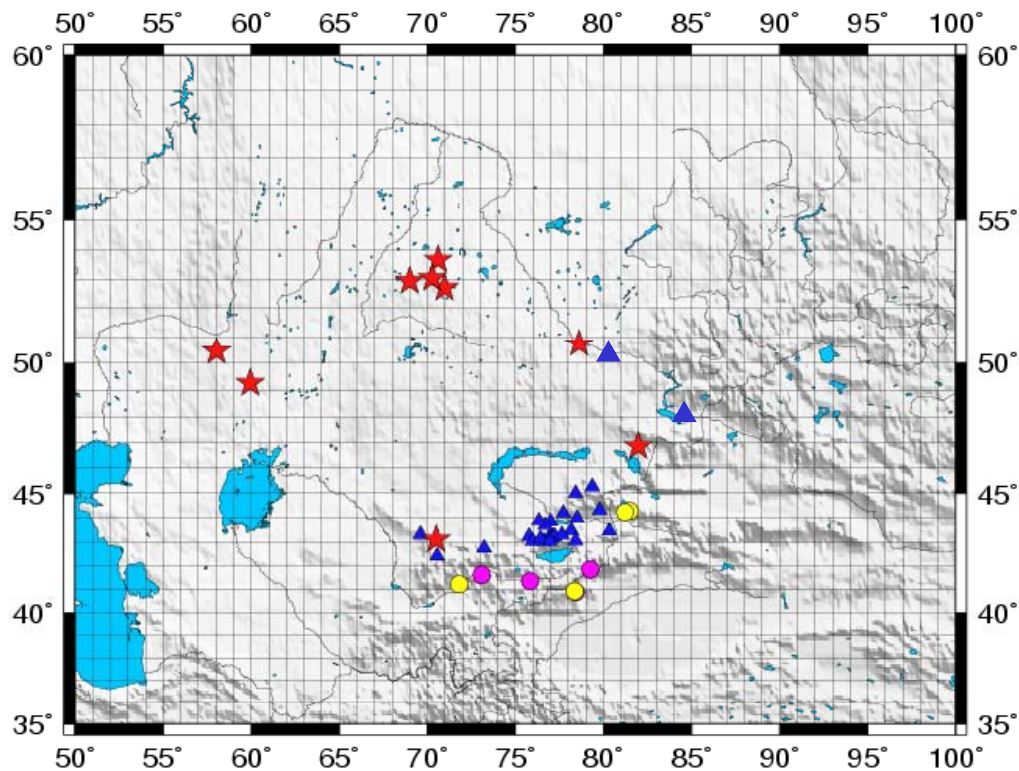
2003 – 100 events (35 matched with REB events);

2004 – 72 events (41 matched with REB events);

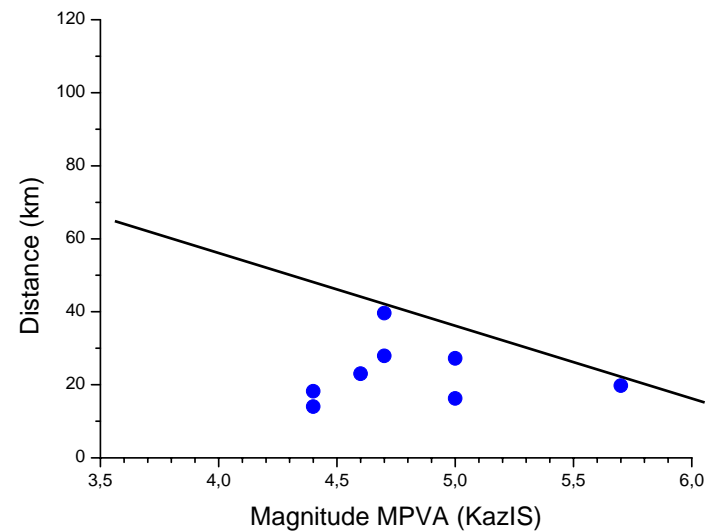
2005 – 63 events (17 matched with REB events);

Year 2000.

Spatial distribution of the distance residuals between REB and KazNDC locations of the same events.

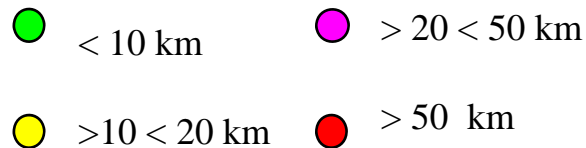
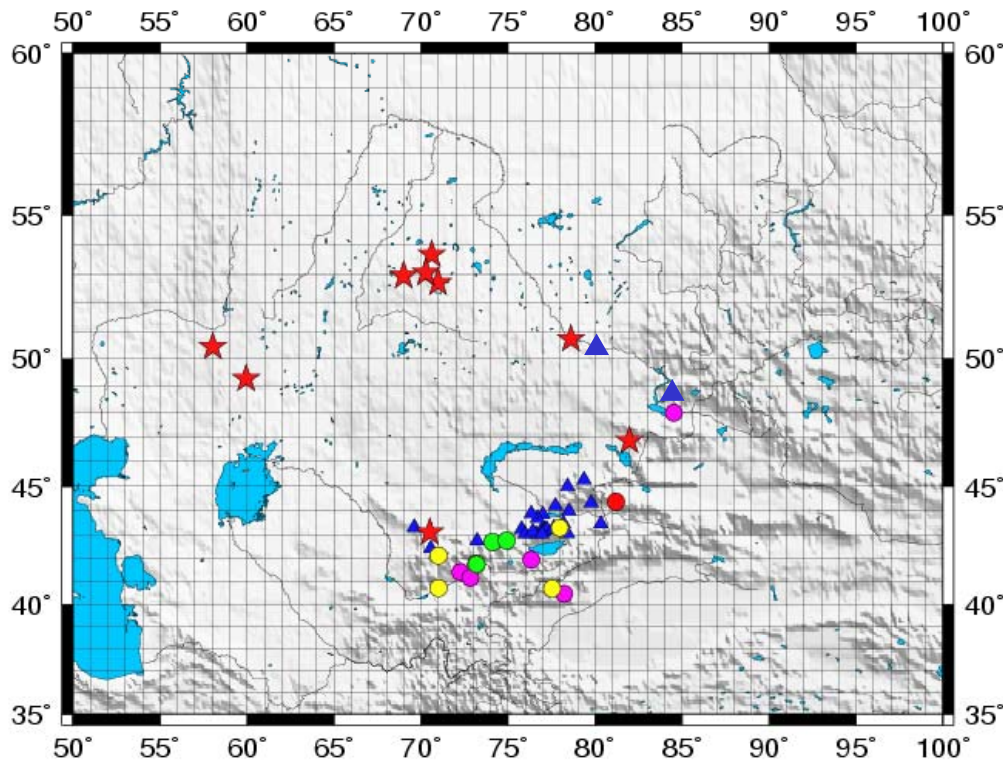


Distance between REB and KazIS locations in dependence of the magnitude.

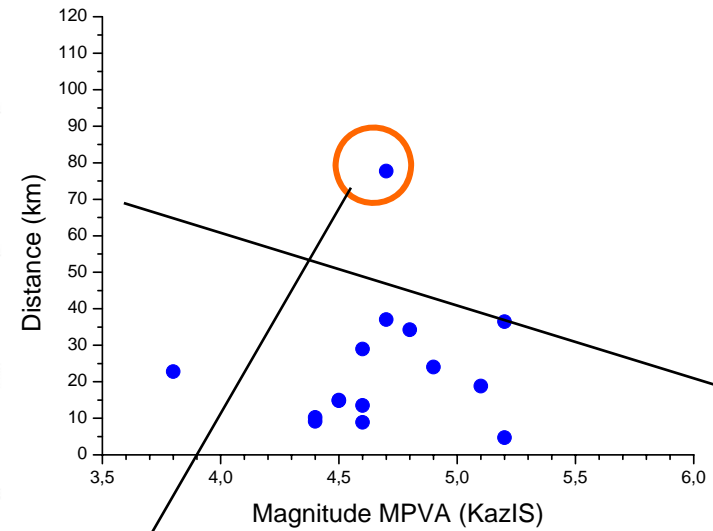


Year 2001.

Spatial distribution of the distance residuals between REB and KazNDC locations of the same events.



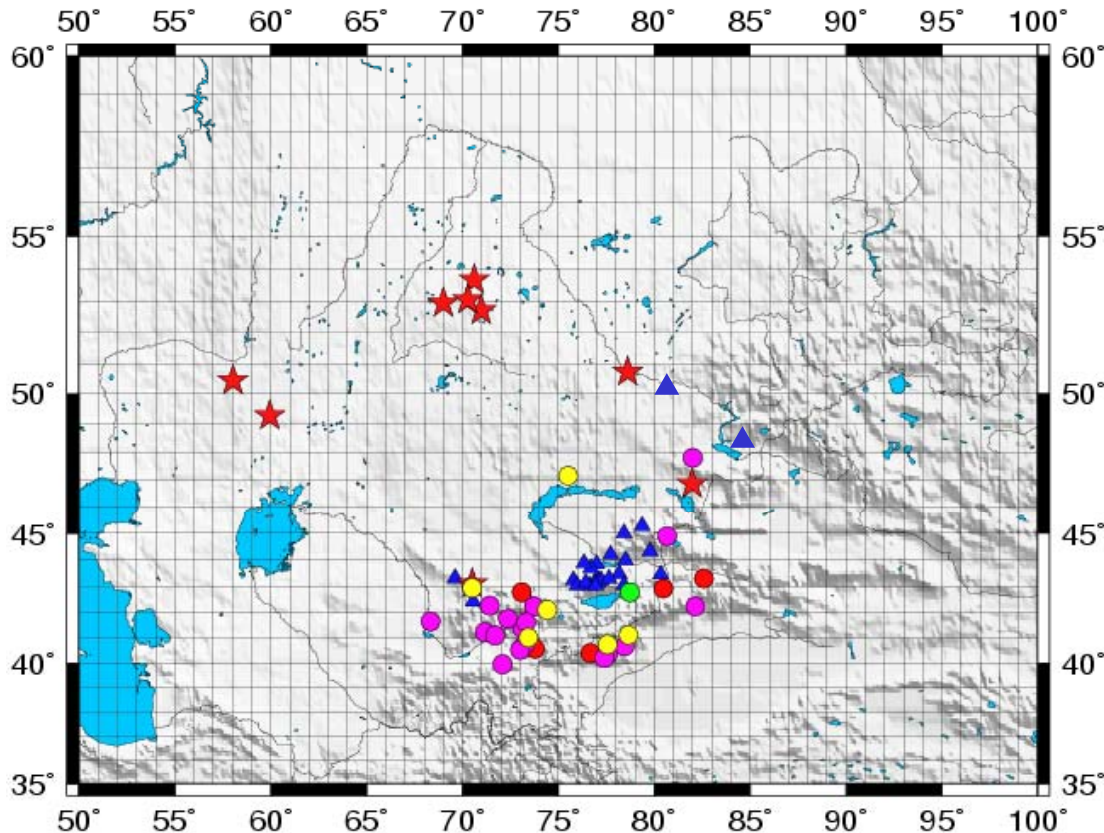
Distance between REB and KazIS locations in dependence of the magnitude.



candidate event for the special analysis

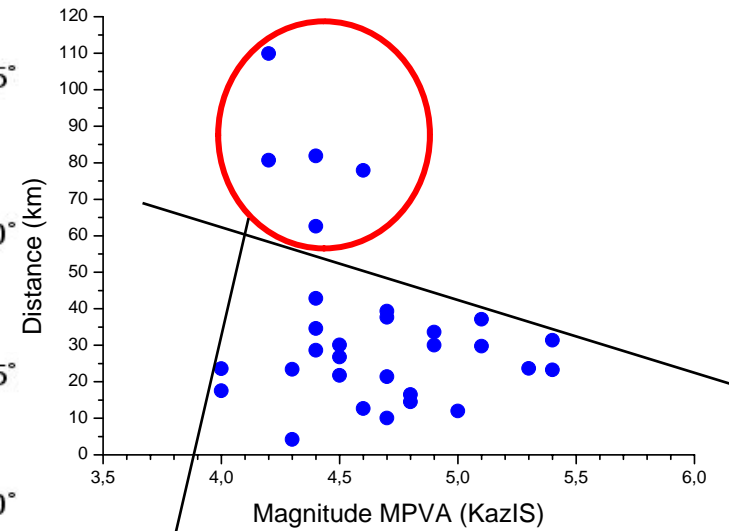
Year 2002.

Spatial distribution of the distance residuals between REB and KazNDC locations of the same events.



- < 10 km
- > 20 < 50 km
- > 10 < 20 km
- > 50 km

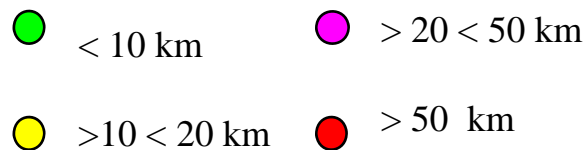
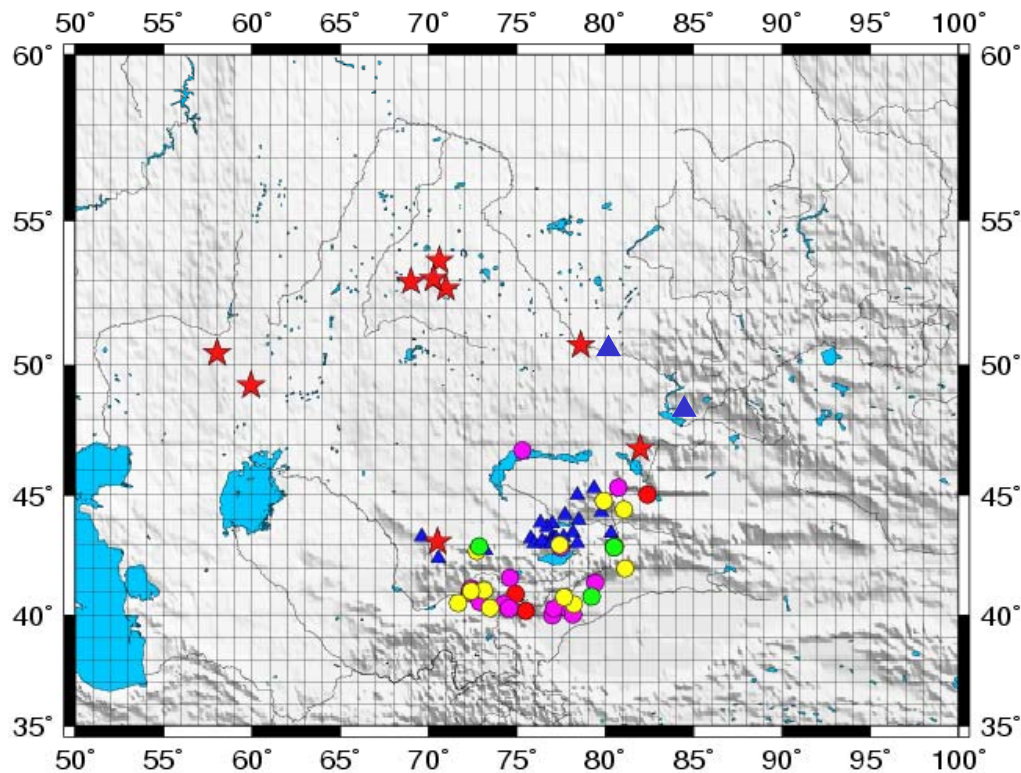
Distance between REB and KazIS locations in dependence of the magnitude.



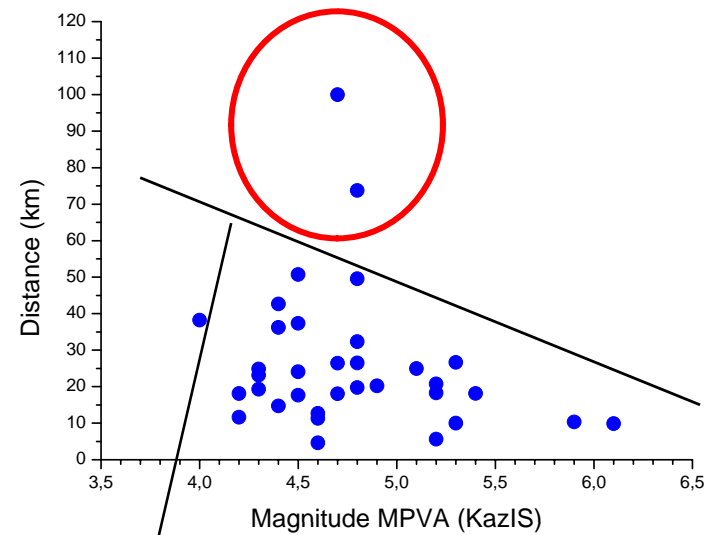
candidate events for the special analysis

Year 2003.

Spatial distribution of the distance residuals between REB and KazNDC locations of the same events.



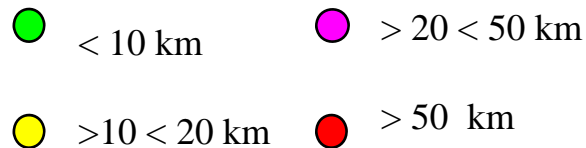
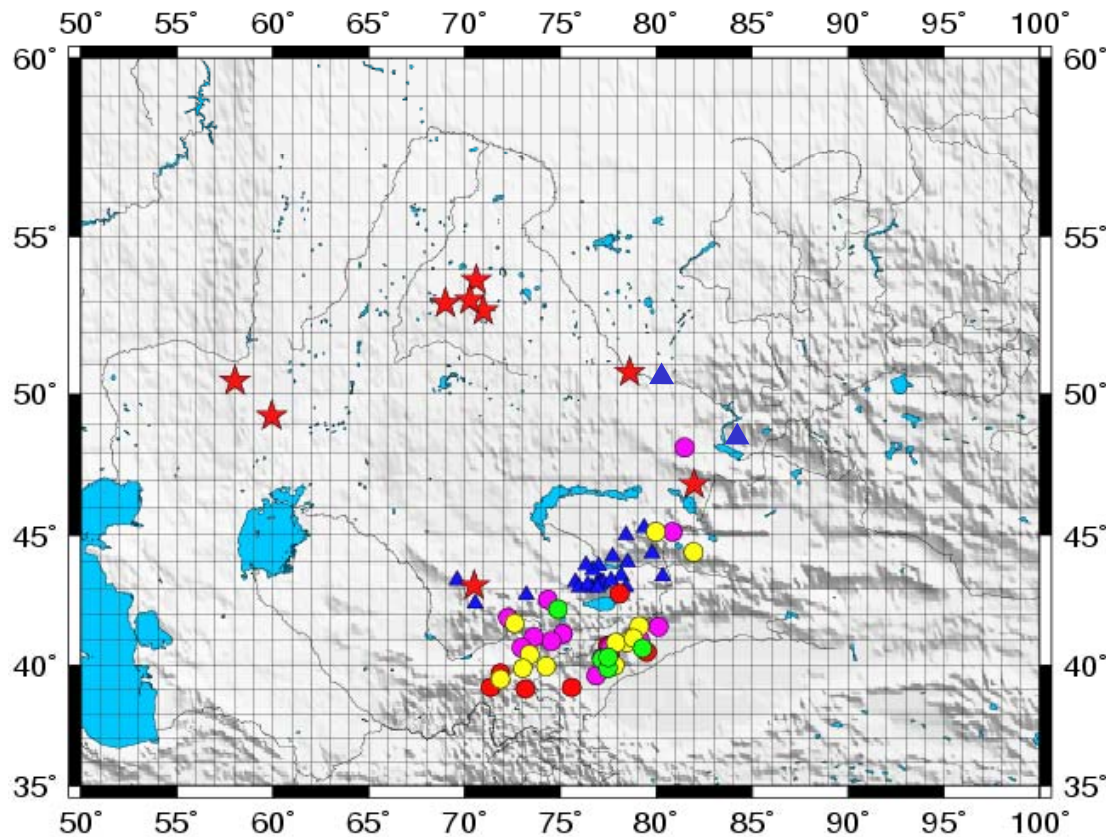
Distance between REB and KazIS locations in dependence of the magnitude.



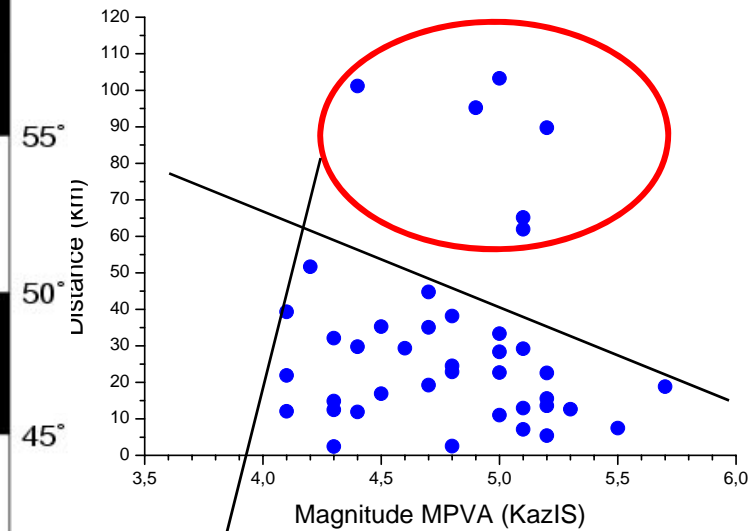
candidate events for the special analysis

Year 2004.

Spatial distribution of the distance residuals between REB and KazNDC locations of the same events.



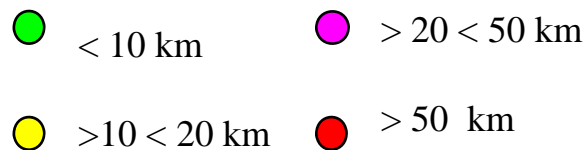
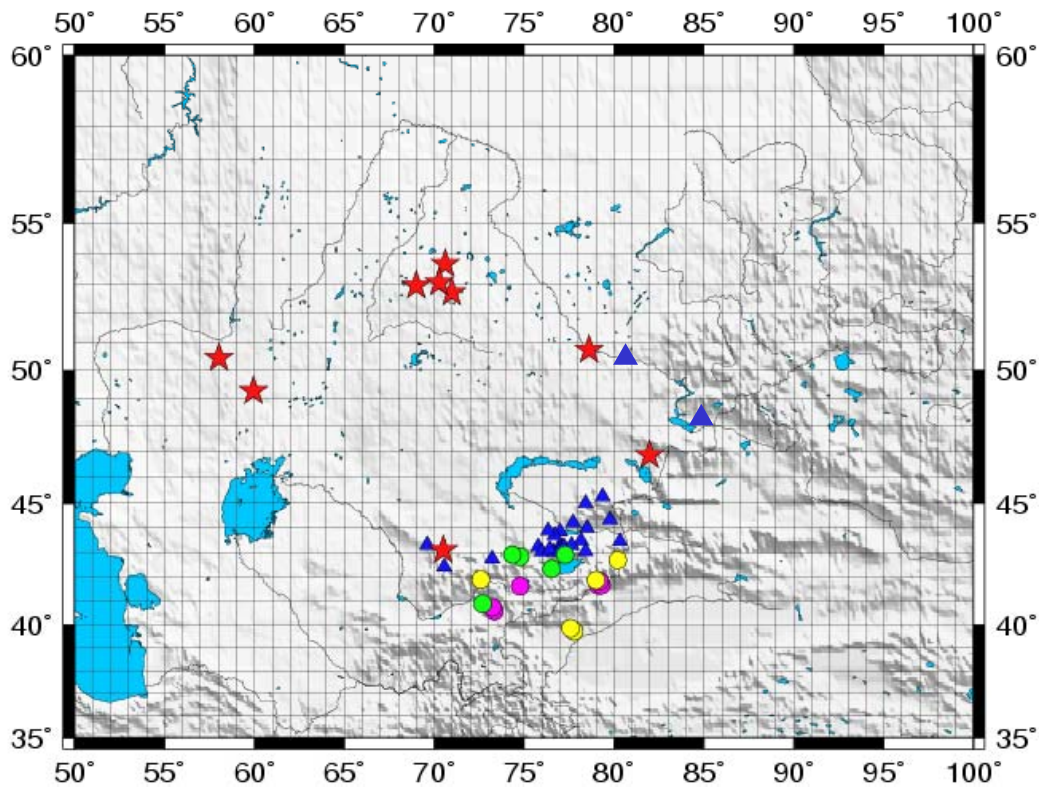
Distance between REB and KazIS locations in dependence of the magnitude.



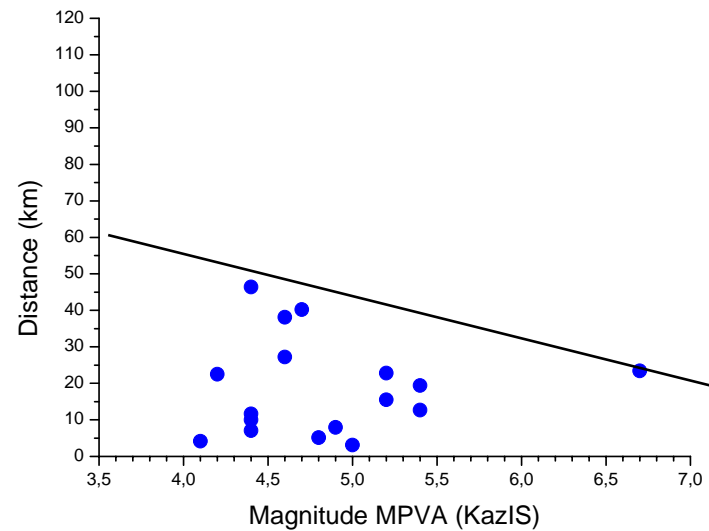
candidate events for the special analysis

Year 2005.

Spatial distribution of the distance residuals between REB and KazNDC locations of the same events.



Distance between REB and KazIS locations in dependence of the magnitude.





Conclusions.

Comparison of the REB bulletin with KazIS catalogue (based on the data of the Kazakh local network) for the years 2000 – 2005 was made.

The increase of the REB magnitude completeness for the events with $MPVA \geq 4.5$ from approx. 60% to more than 80% was revealed.

Several events with high distance between REB and KazIS locations were found.

In order to find out the reasons of such large residuals in location it is necessary to carry out the special analysis.