

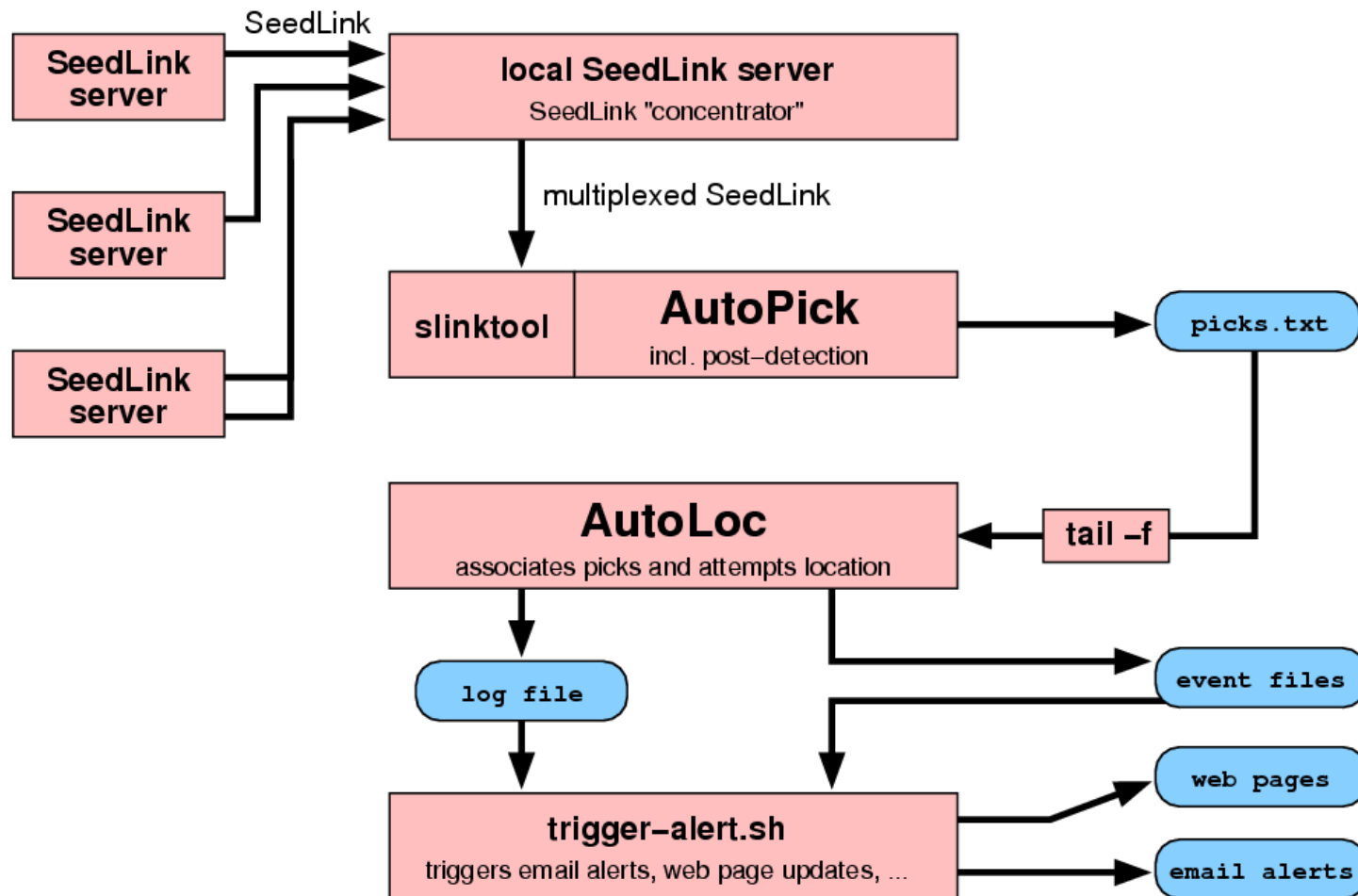


# *Status, Development and Future of AutoLoc*

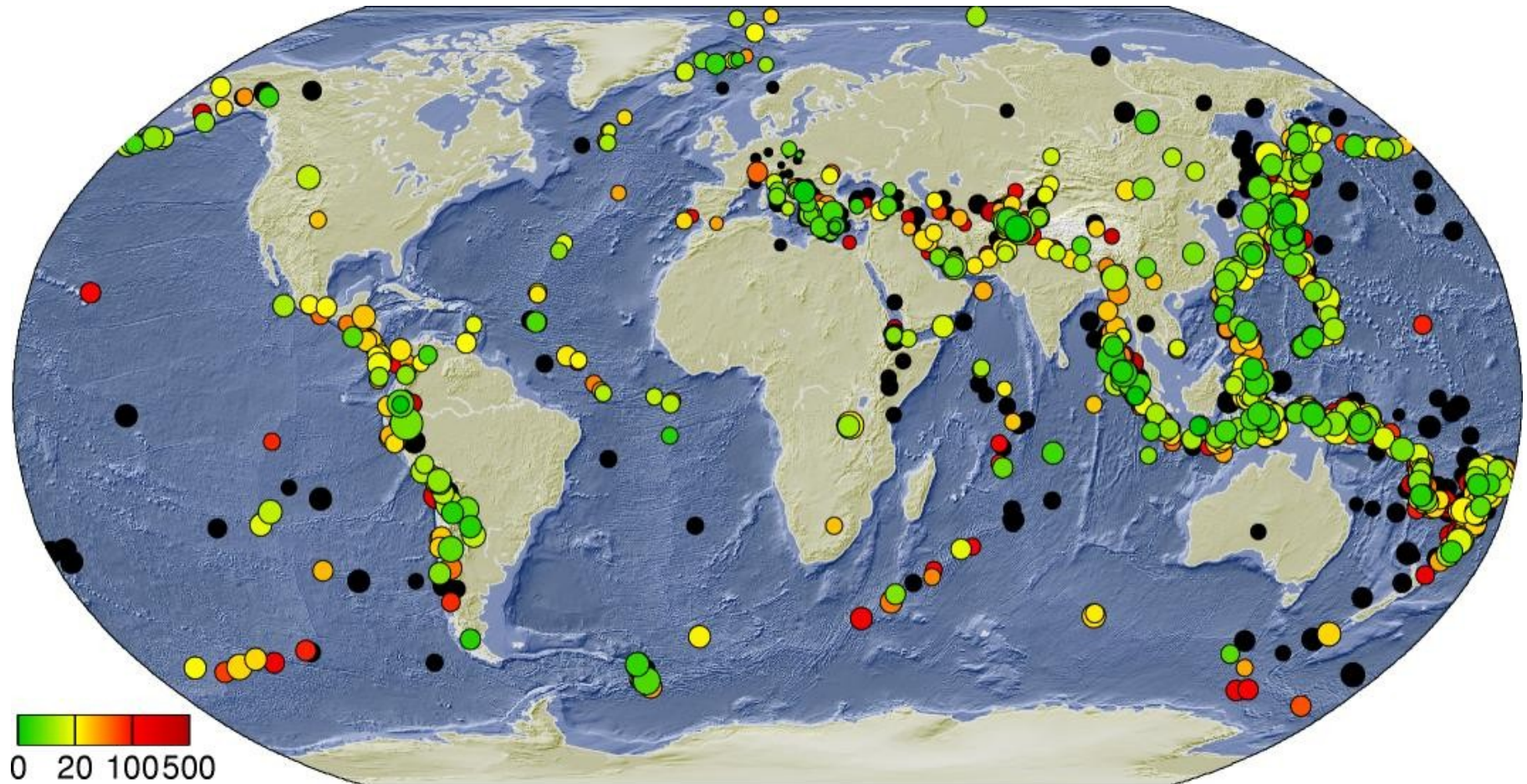
## *AutoLoc 2*

- ◆ teleseismic association using global grid search (configurable)
- ◆ locator still based on LocSAT and IASP91-based tables
- ◆ event information written to text files similar to those of AutoLoc 1
- ◆ sending of alerts using AutoLoc 1 (proc\_alert etc.)
- ◆ mapping facility difficult to install, therefore not included in current distribution (an improved version is being worked on)
- ◆ configuration options very limited, via several text files
- ◆ good performance at global and regional (e.g. Indonesia) scale
- ◆ not well tested for small regional networks

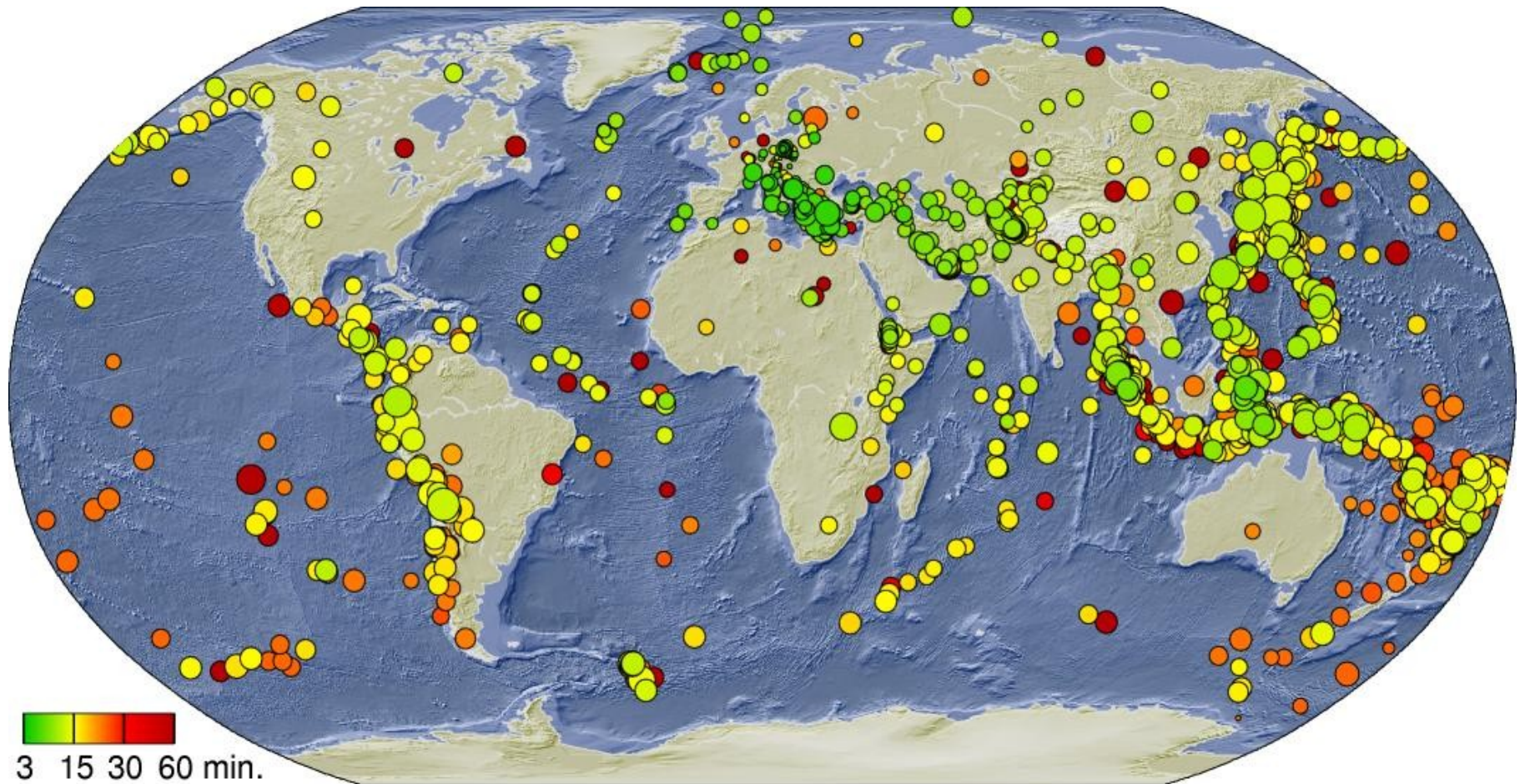
# Overview of AutoLoc2 (as of May 2006)



## *Differences GEVN/NEIC during 2005*

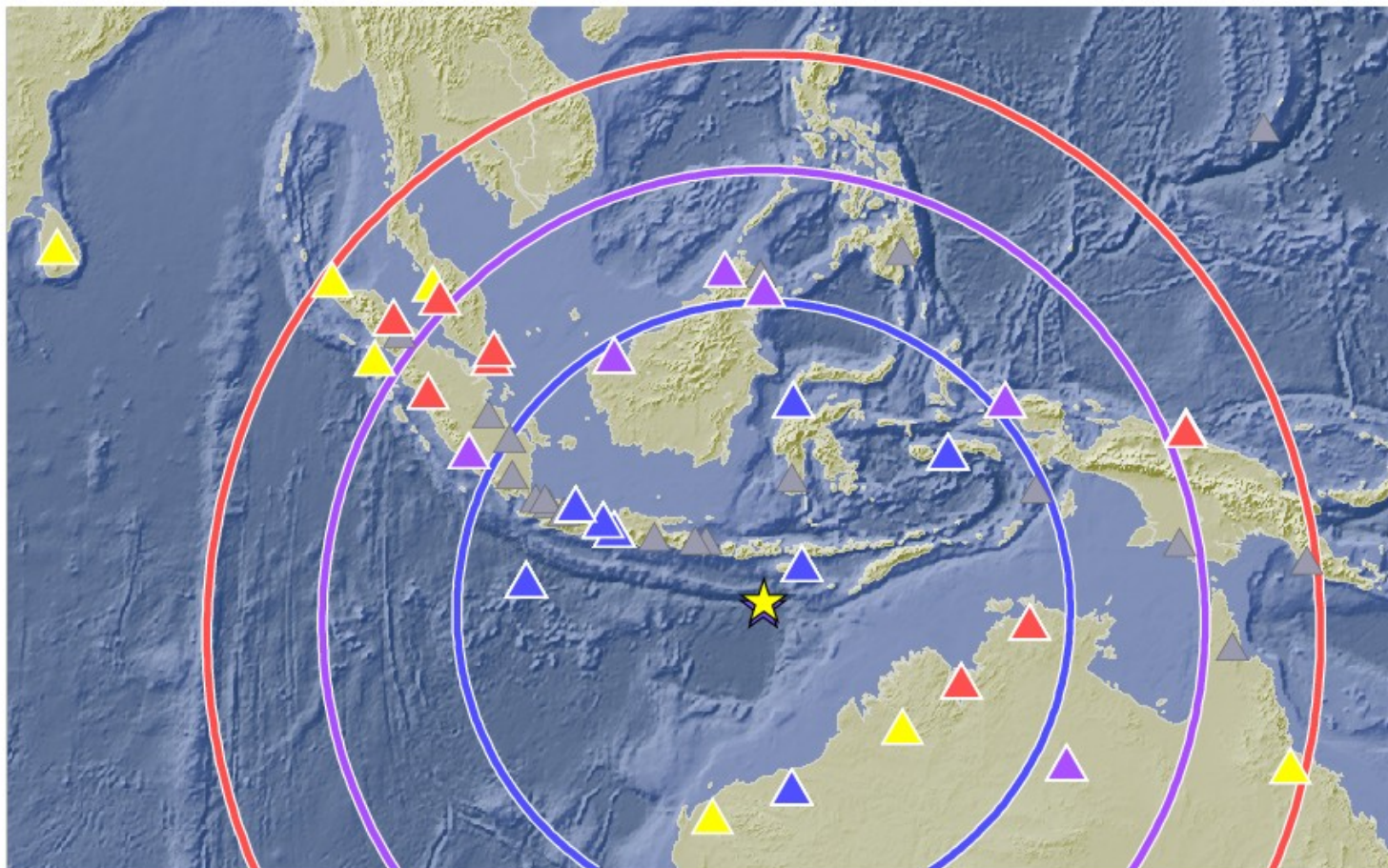


# *Email publication delays during 2005*



## *Example: Event in Indonesia*

2006/04/29 04:06 South of Sumbawa, Indonesia mb 5.8



6m 5m 3m43s



29 April 2006 (119)

South of Sumbawa, Indonesia

Location estimate (+/- standard deviation)

Origin time 04:06:10.3 +/- 0.4 sec  
Latitude 11.62 S +/- 5.2 km  
Longitude 118.16 E +/- 4.0 km  
Depth 0.0 km (fixed)

Magnitudes:

ML=6.8 (1) mb=0.0 (0)  
Median=6.8 (1)

90-Percent confidence region ellipse:

Semi-major axis 27.3 km strike: 168.8 deg  
Semi-minor axis 20.5 km  
Origin time error 1.7 sec

LocSAT solution (with start solution, 8 stations used, weight 8):

South of Sumbawa, Indonesia ML=6.8 2006/04/29 04:06:10 11.62 S 118.16 E 0 km

Stat	Net	Date	Time	Amp	Per	Res	Dist	Az	mb	ML
WSI	IA	06/04/29	04:06:54.0	0.0	0.0	-3.0	2.9	47.3	0.0	6.8
YOGI	GE	06/04/29	04:08:16.0	0.0	0.0	0.1	8.6	295.4	0.0	0.0
BJI	IA	06/04/29	04:08:26.2	0.0	0.0	0.2	9.4	296.4	0.0	0.0
MBWA	IU	06/04/29	04:08:29.6	0.0	0.0	0.3	9.7	171.3	0.0	0.0
PCI	IA	06/04/29	04:08:47.0	0.0	0.0	1.9	10.8	8.9	0.0	0.0
JCJI	IA	06/04/29	04:08:47.1	0.0	0.0	-1.3	11.0	296.8	0.0	0.0
XMIS	AU	06/04/29	04:09:06.6	0.0	0.0	0.3	12.3	274.1	0.0	0.0
AAI	IA	06/04/29	04:09:11.2	0.0	0.0	1.5	12.6	51.9	0.0	0.0

RMS-ERR: 1.09

First location: 2006/04/29 04:09:56 UTC

This location: 2006/04/29 04:09:56 UTC

# *Towards AutoLoc 3*

## *work in progress*

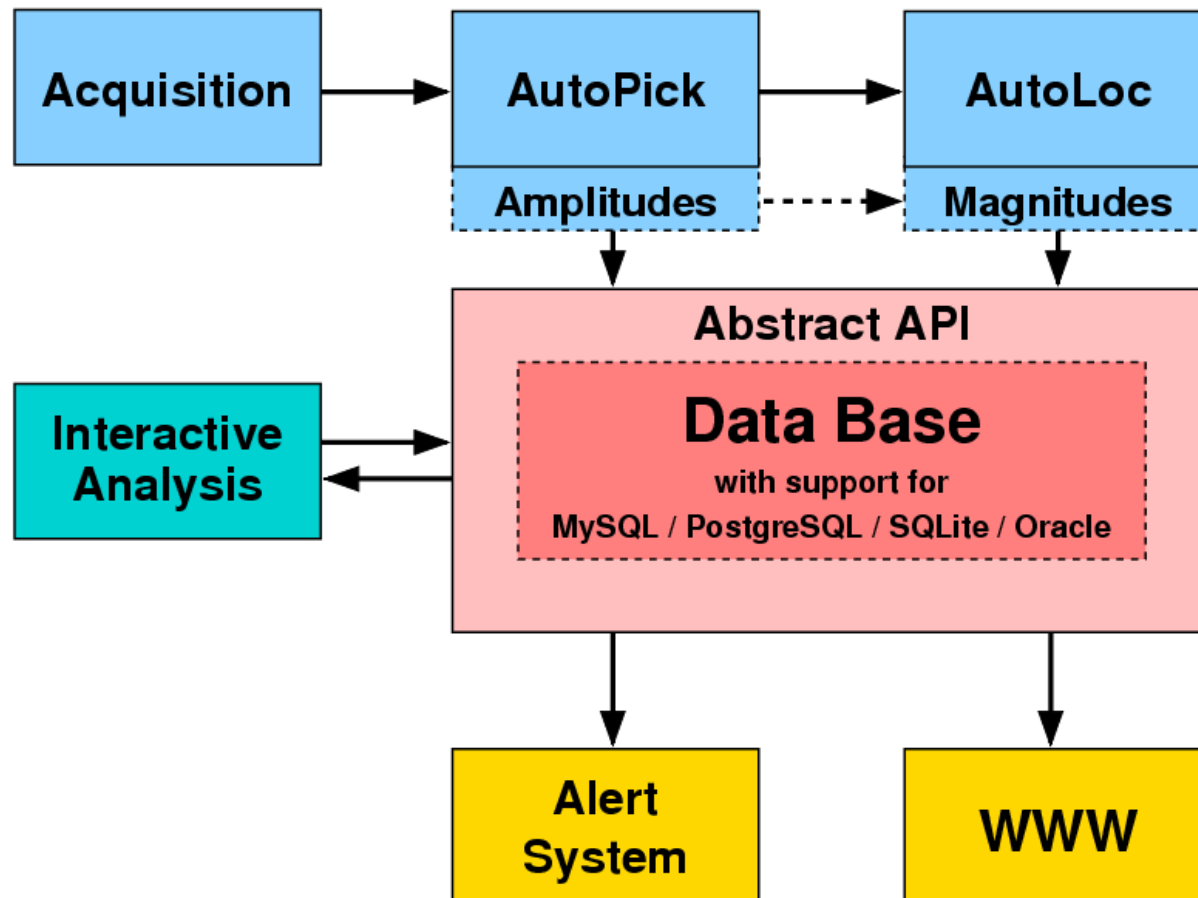
- ◆ pick/event database incl. abstract API (Python)

```
from seiscomp.event_db import EventDB
edb = EventDB()
```

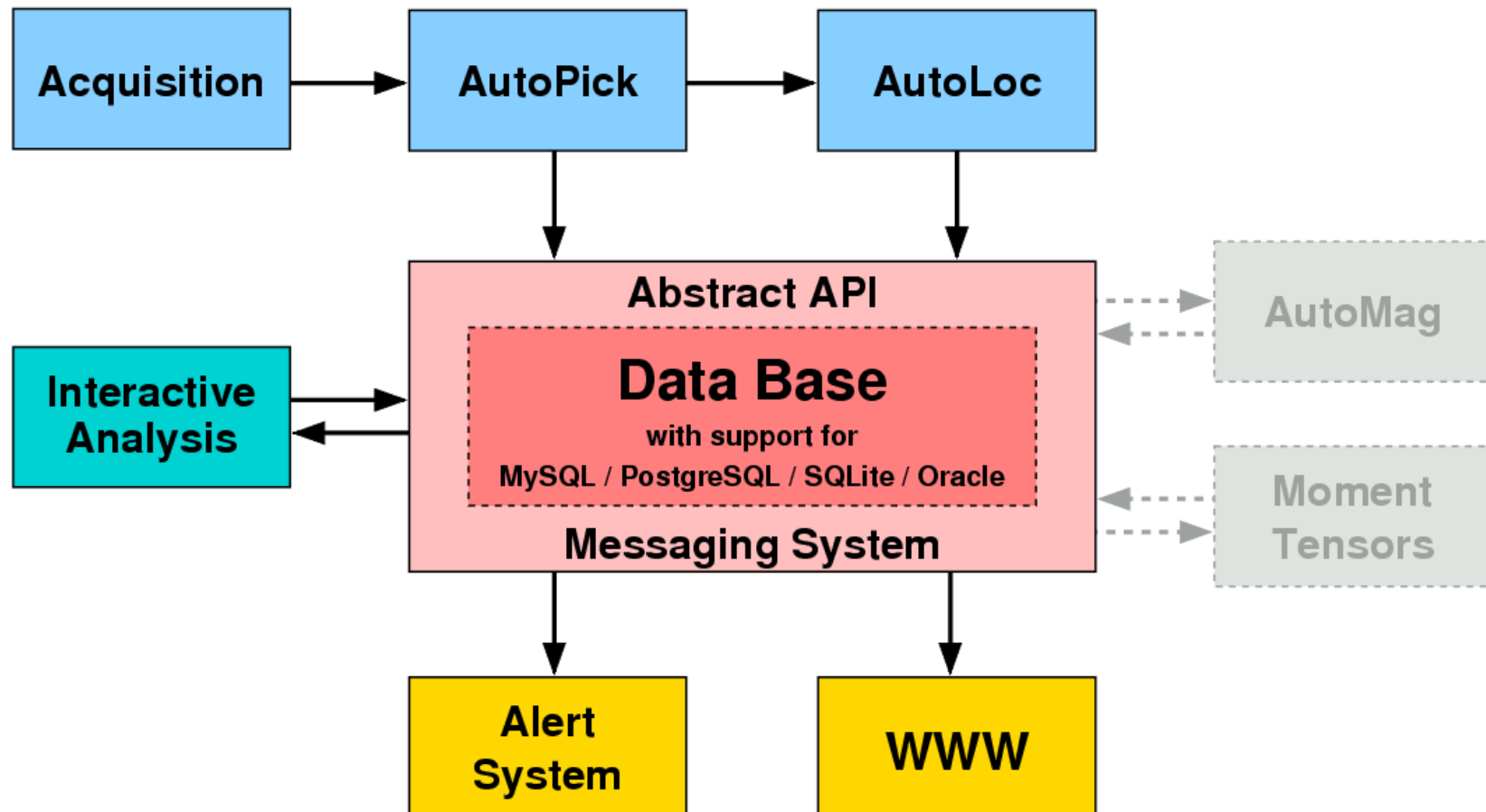
```
for origin in edb.get_origins(twin=(-3600,0), agency="GFZ"):
    print origin
```

- ◆ alert database (criteria, recipients, mechanism, logging)
- ◆ support for SQLite for “out-of-the-box” use and testing, MySQL for more advanced use, support for other DBMS's planned
- ◆ improved mapping facility (faster, easier to install and maintain)
- ◆ much improved web page generation (current approach PHP based but not portable)

## *Concept of AutoLoc 2*



## *Towards AutoLoc 3*



## *Near-future plans*

*(next 3-6 months)*

- ◆ separation of the modules and loose coupling via messaging system
- ◆ separate magnitude computation from phase detector and make it a stand-alone module for all kinds of magnitudes (initially mb+ML)
- ◆ extend set of magnitudes: mB(c), Ms(20s+BB), Mw, mbLg, Mm, Me
- ◆ optimize database schema (discussion with SeisComP community)
- ◆ continue development of database API
- ◆ integrate a much simpler mapping utility (especially for online publication) as the current approach using GMT is not portable enough and much too slow
- ◆ map display of network status (working vs. dead stations, triggering stations before location is available)



## *Future plans*

### *(towards SeisComP 3)*

- ◆ wave server
- ◆ multi-band picking (several frequency bands and amplitude thresholds)
- ◆ automatic pP+S picker
- ◆ integrate own interactive analysis utilities especially optimized for use in real-time
- ◆ additional modules, e.g. for moment tensor computation
- ◆ improve SeedLink monitor (use database facilities, decouple web page generation)
- ◆ XML schema for AutoLoc (based on QuakeML? - discussion required)
- ◆ add support for more DBMS (currently SQLite, MySQL)
- ◆ GUI based configuration together with the rest of SeisComP
- ◆ Locator that allows use of regional velocity models (n:ow IASP91 only)