Geodetic research at IRA-INAF: recent results between a golden past and a gloomy future

M. Negusini, P. Sarti and C. Abbondanza
Istituto Nazionale di Astrofisica (INAF) – Istituto di Radioastronomia (IRA)

19th European VLBI for Geodesy and Astrometry (EVGA) Working Meeting
Bordeaux - March 24-26, 2009

The "golden" past (1)

- In the early 80's, IRA begins VLBI operations for astronomy and geodesy (Setti 2006)
- 31st Jan. – 7th Feb. 1987: Medicina's first geodetic experiment (Tomasi et al. 1988)
- June 1989: Noto's first geodetic observation (Tomasi 1993)
- 1987-2008: Medicina has performed 360 sessions (> 16 sess./yr.)
- 1989-2008: Noto took part in 180 sessions (9 sess./yr.)

The "golden" past (2)

- Medicina and Noto are twin 32-m, AZ-EL telescopes.
- The PR is made by 240 panels; since 2001, Noto has an active surface (Orfei et al. 2004).
- Medicina frequency operability: 1.4 – 22 GHz
- Noto frequency operability: 0.3 – 43 GHz

The "golden" past (3)

- Matera: IRA's branch in 2001 increases rapidly almost doubling the personnel. Main research activities are focussed on:

  - ✓ geodesy
  - ✓ geology
  - ✓ remote sensing

A sudden decay (2003 - 2004)

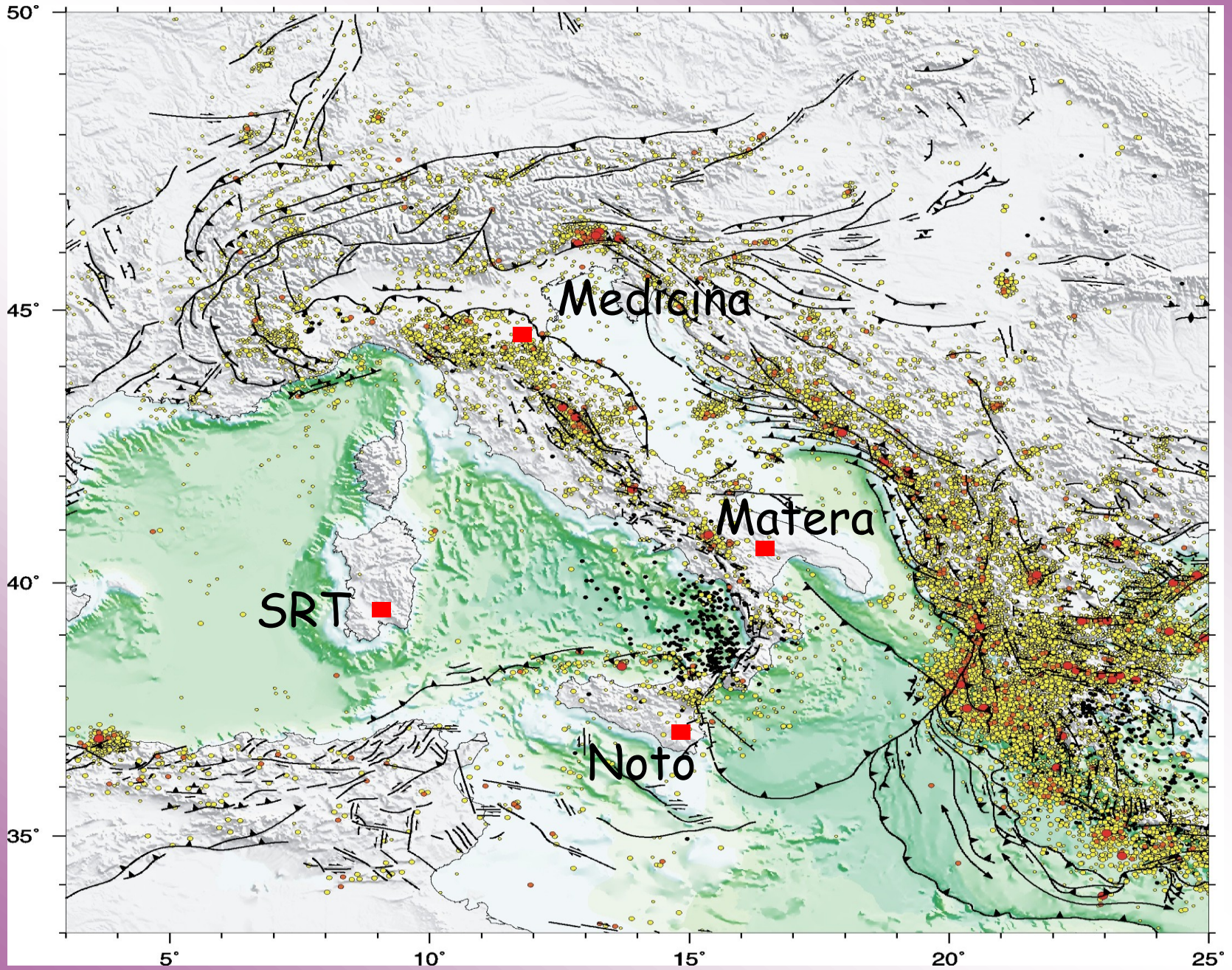
- 2003: IRA is moved from CNR to INAF during the re-organization of National public research institutions.
- The new INAF is a monothematic institute and its mission does not comprehend geodetic research.
- 2004: IRA terminates its activity in Matera closing the local branch
- Since then, several attempts are made to reinsert geodesy as a research activity within INAF's investigation areas; all attempts fail.

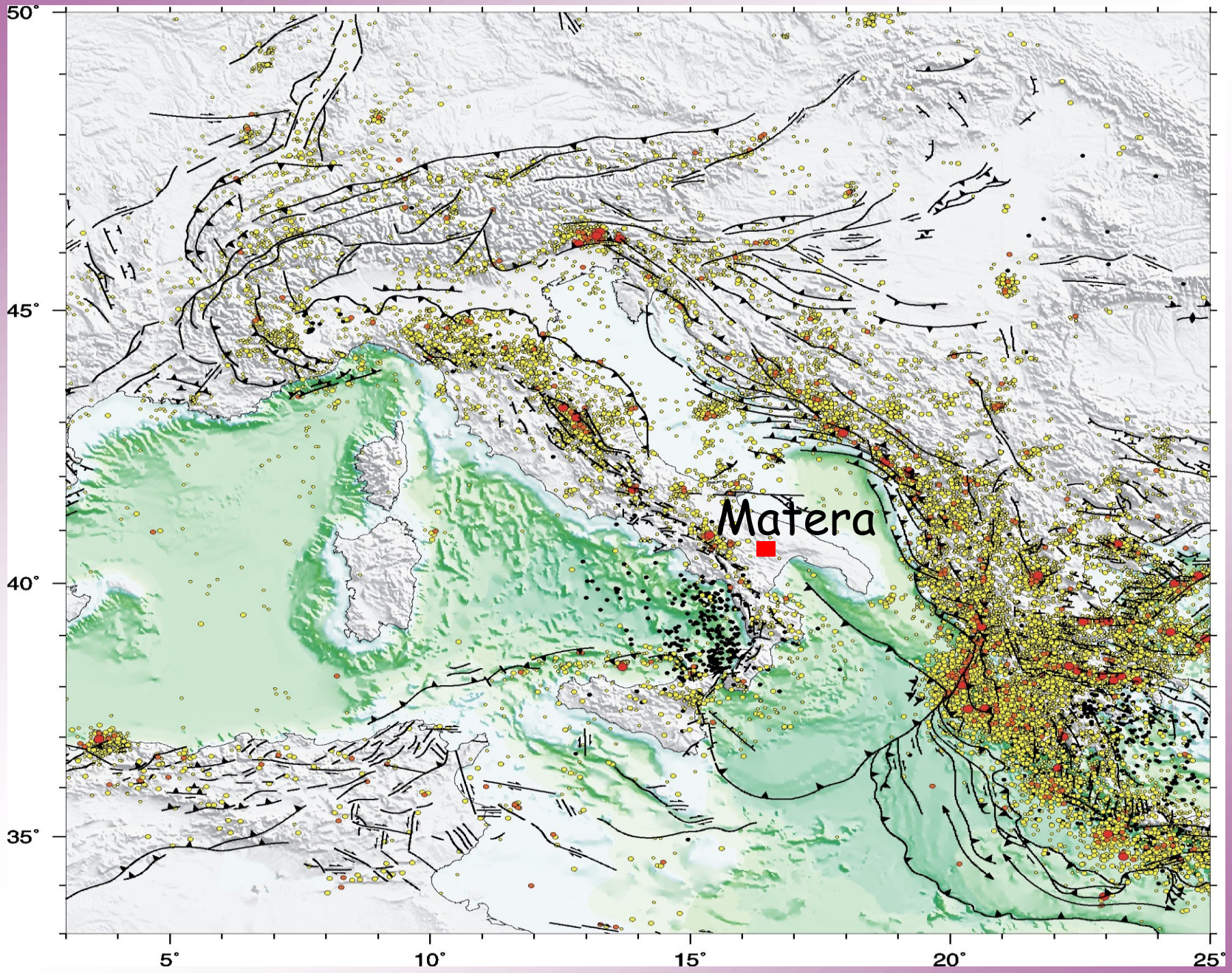
The decay (2004 – 2009)

- Radioastronomy itself is **severely questioned** within INAF.
  - 2007: INAF answers to the Italian Ministry of Research's call for projects and ranks the Italian VLBI infrastructure as last, out of ten astronomical infrastructures to be developed.
  - In October 2007, a Visiting Committee (George Miley-Chair, Frank Bertoldi, Frank Verbunt, Tom Wilson.) is established to evaluate the scientific performances of IRA. The report is very positive and can be found at: http://www.ira.inaf.it/Research/VC_files/Total.pdf
  - VC suggestions **are ignored** and a second meeting is held in October 2008 with the purpose to **re-evaluate** the role of radioastronomy within INAF.
  - Only national experts take part: the president and a few members of the scientific council of INAF.
  - The outcomes can be summarized as follows: a **gloomy** future.

The gloomy future (2009 – 2011)

- Geodesy is officially out of the scope of INAF: this statement is explicitly made by INAF's president.
- Noto and Medicina telescopes will continue to observe until Sardinia Radio Telescope (SRT) is fully operable (late 2010-2011).
- SRT will drain almost totally INAF's budget for radioastronomy.
- Therefore, SRT will be the only INAF's radiotelescope and is going to "replace" Noto and Medicina antennas.
- There is no plan to equip SRT with S/X bands receivers.

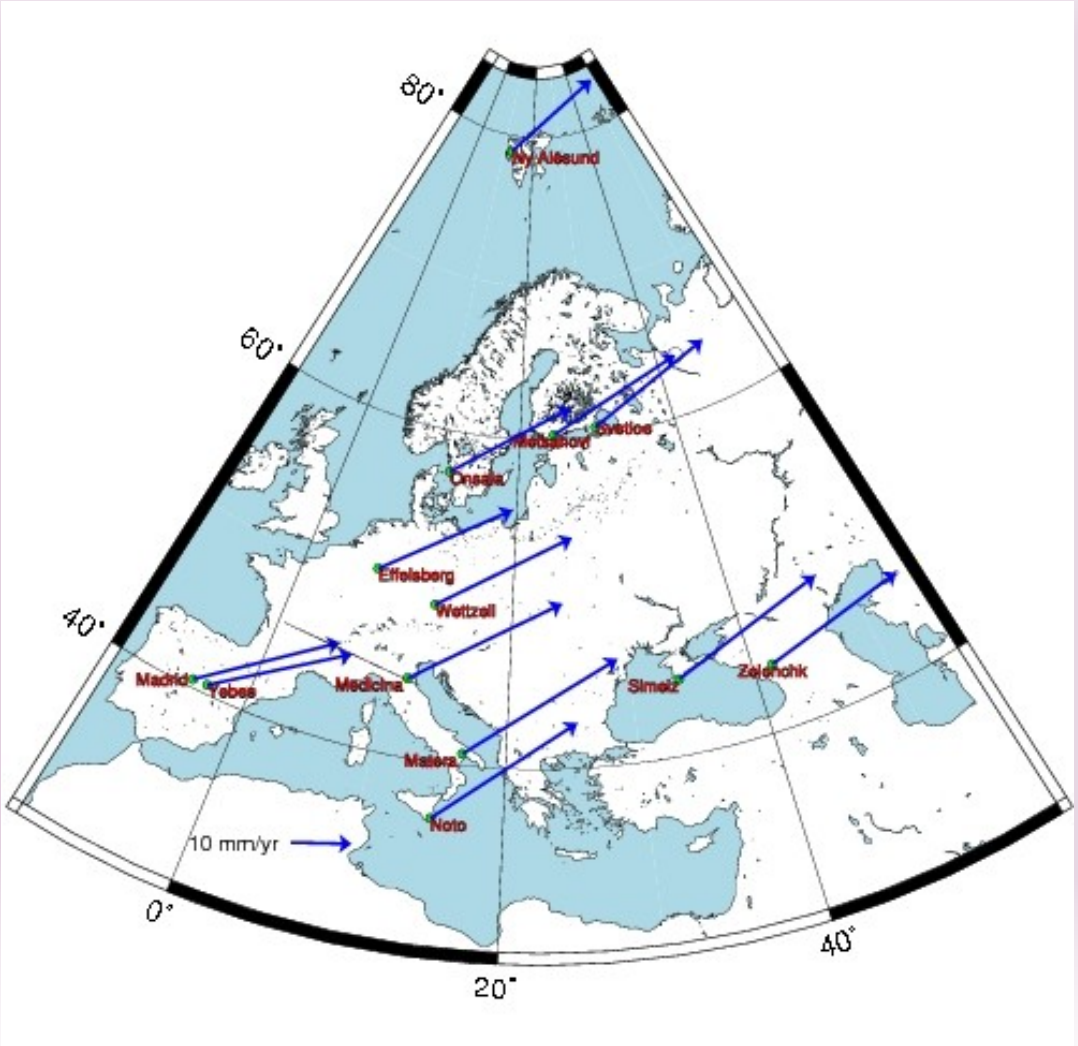

50°
45°
40°
35°
5°
10°
15°
20°
25°
Medicina
Matera
SRT
Noto


50°
45°
40°
35°
5°
10°
15°
20°
25°
Matera

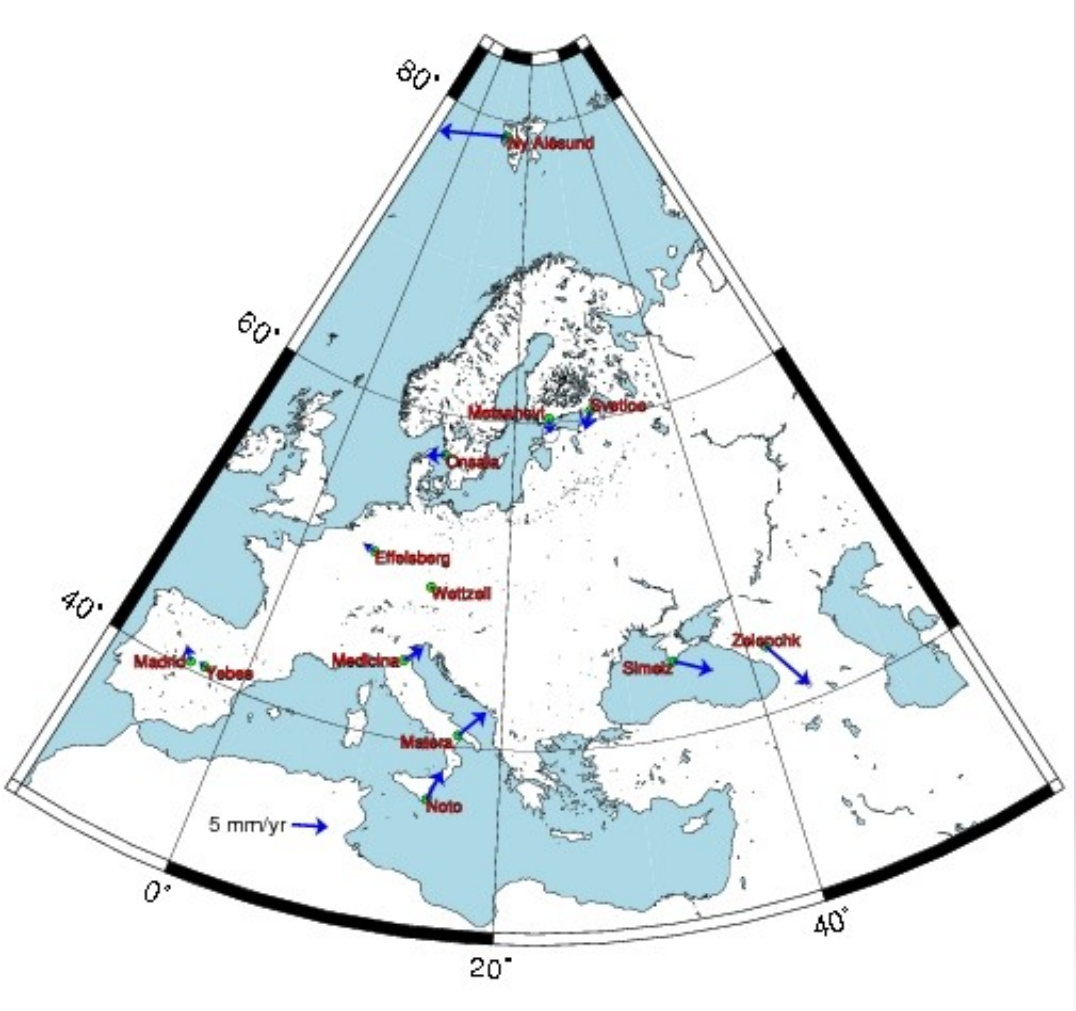
IRA 2009 solution

- Mark-5 Calc/Solve
- DB from 1987 to 2008
- Global solutions:
  - European
  - Global
- Baseline Lengths
- Troposphere Parameters

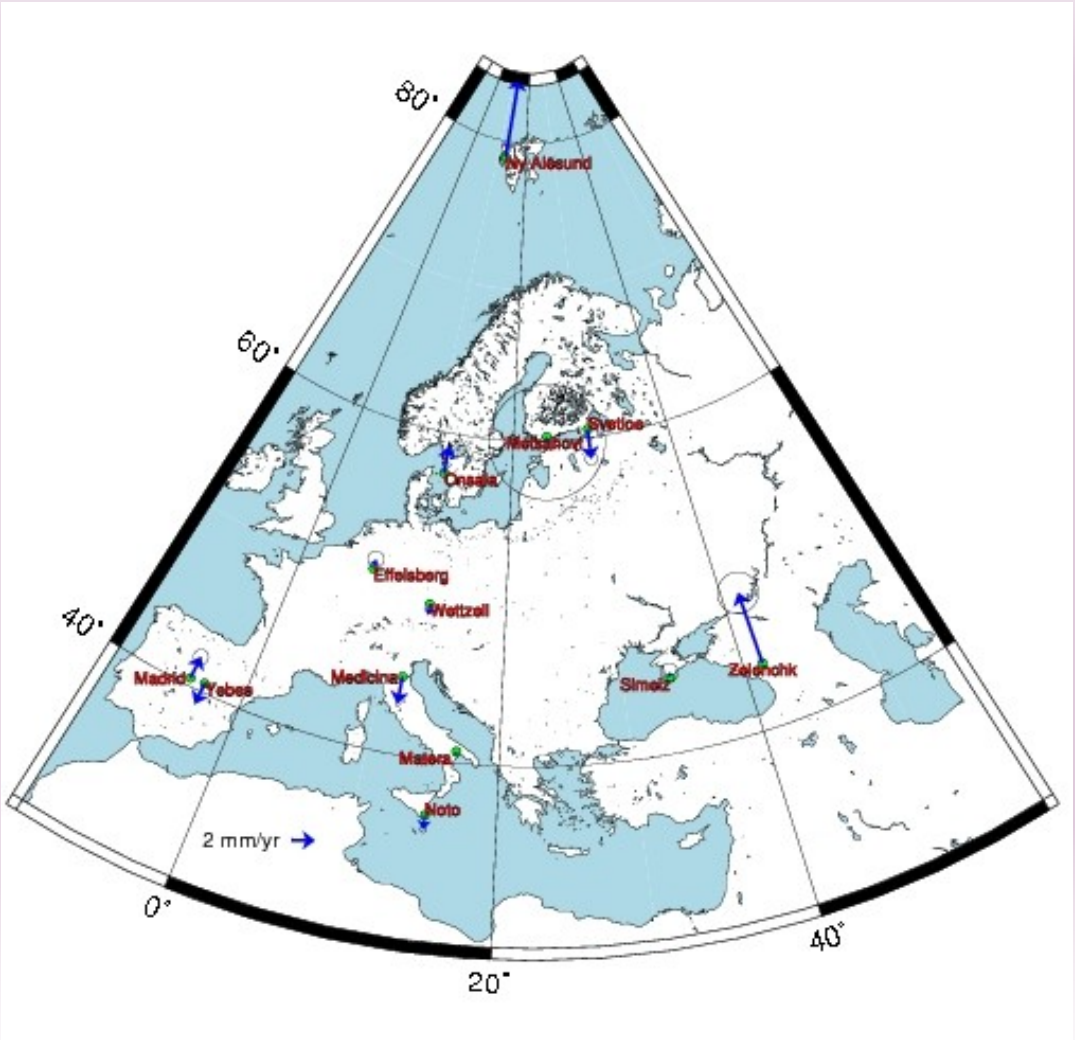
Absolute velocity



Relative velocity



Vertical velocity



Thank you for your attention

References

- Orfei, A, Morsiani, M., Zacchiroli, G., Maccaferri, G., Roda, J. and Fiocchi, F. (2004) "An active Surface for Large Reflector Antennas". *IEEE Antennas and Propagation Magazine*, 46, 4, 11-19.
- Setti, G. (2006). "Synthetic history of the SRT project". *Mem. S.A.It. Suppl.* Vol. 10, 15. Science with the Sardinia Radio Telescope, Bologna, May 10-11, 2005 Editors: Jan Brand, Karl-Heinz Mack and Isabella Prandoni.
- Tomasi, P., Mantovani, F., Ambrosini, R., Bombonati, A., Grueff, G., Nothnagel, A. and Schuh, A. (1988). "The first geodetic VLBI experiment with the Bologna radio telescope". Il Nuovo Cimento, 11 (2) / March, 1988: 205-208 edited by SpringerLink, DOI 10.1007/BF02561732.
- Tomasi, P. (1993). "Noto station status report". *Proc. IX Working Meeting European VLBI for Geodesy and Astrometry* edited by J. Campbell and A. Nothnagel – Bonn, 30 September-01 Octoberl 1993, 81, 11-12.