

# IAG Working Group "Regional Dense Velocity Fields": Objectives and Future Plans



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# Introduction Due to its accuracy, low cost of receivers, versatility and the ability to provide results in a global reference frame, Global Navigation Satellite Systems (GNSS) are presently the main sensor of the Earth's surface deformation. Consequently, GNSS networks have been installed all over the world and repeated GNSS campaigns are conducted to monitor ground deformations. In addition, a large number of Continuous Operating GNSS Reference Stations (CORS) are in use today for multi-disciplinary applications ranging from surveying to numerical weather prediction. **IAG Commission 1** Reference Frames Sub-commission 1.3 Regional Reference Frames Other sub-commissions Sub-commissions 1.3 e Sub-commission 1.3 d Sub-commission 1.3c Sub-commission 1.3b Working Group Sub-commission 1.3a SIRGAS) Regional Dense Velocity Fields Europe (EUREF) The regional sub-commissions within IAG sub-commission 1 "Regional Reference Frames" have already made a first step in coordinating these activities in order to maintain their regional reference systems compatible with the ITRF. **Objectives** This working group on Dense Regional Velocity Fields aims at joining the efforts of the regional sub-commissions within IAG sub-commission 1.3 together with the groups processing local/regional CORS or repeated GNSS campaigns with the following goals: ☐ Define specifications and quality standards for the regional SINEX solutions and relevant meta-data, ☐ Collect SINEX solutions and their meta-data, ☐ Study in-depth the individual strengths and shortcomings of local/regional and continuous/epoch GNSS solutions to determine site velocities, ☐ Define optimal strategies for the combination of regional and global SINEX solutions,

☐ Provide dense regional velocity fields,

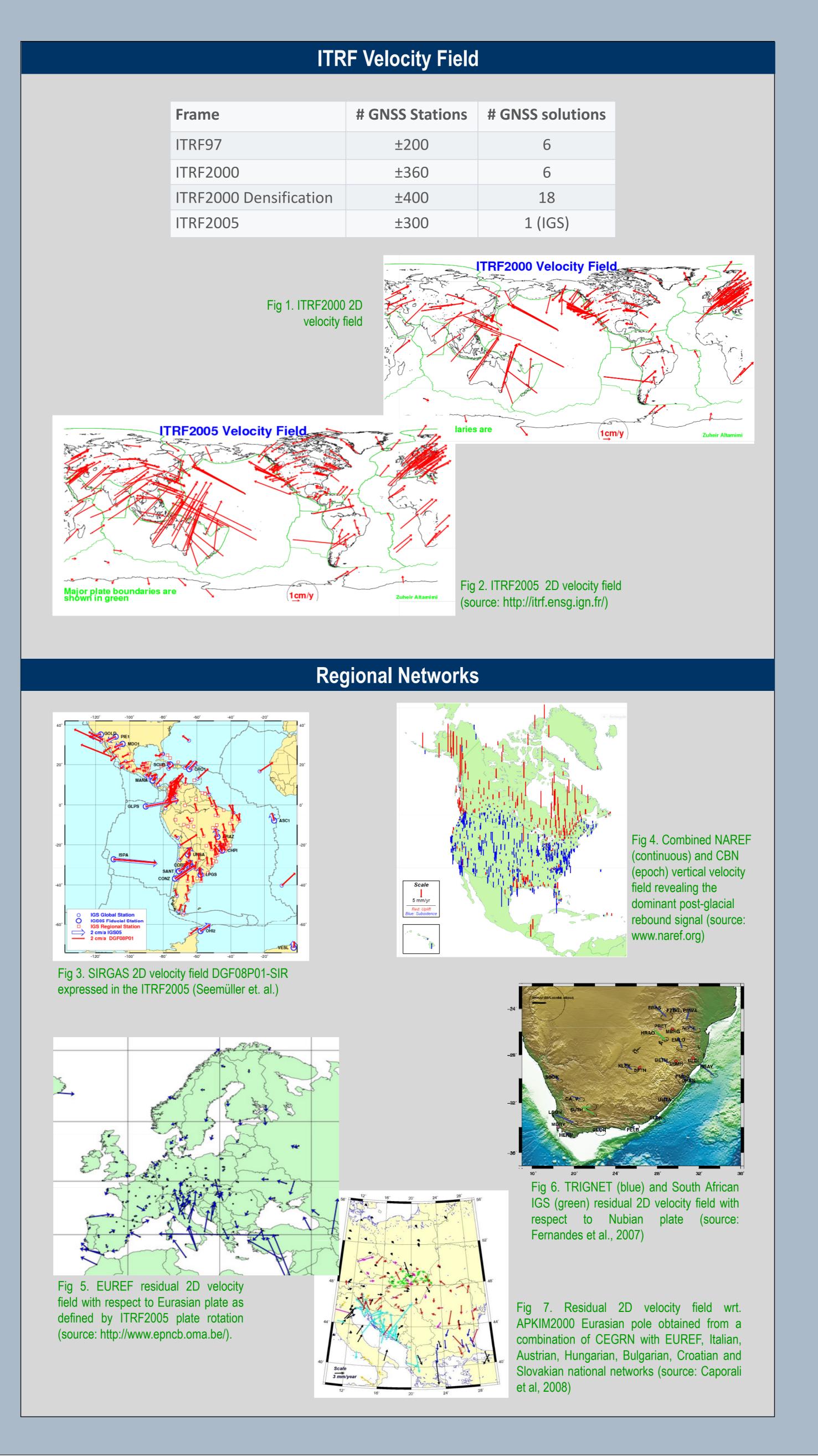
the products of the WG,

☐ Encourage participation in related symposia,

☐ Provide the densification of the ITRF2005 (or its successor),

☐ Implement a web site in order to provide information on the activities and access to

☐ Prepare recommendations and a comprehensive final report on the WG activities.



# **Future Plans and Open Questions**

#### Cumulative or weekly SINEX contributions?

#### Densification by weekly combination

- Consistency in corrections and processing options: antennae, tides, loading, 2<sup>nd</sup>
  order ionospheric effect, tropospheric mapping function
- Solutions since week 1400 are incompatible with older ones because of IGS adoption of absolute PCV since week 1400
- Covariance matrix scaling
- Outlier detection and need for detailed meta-data
- Link with IGS Global Network Associate AC combination

# Densification by combination of cumulative solutions

- + SINEX contain coordinates and velocities
- + Consistency issues dealt with at regional level
- + Outlier detection is done at regional level
- No coordinate time series
- Step-wise combination of global and regional solutions

## Role of non-continuous GNSS?

- ☐ Precision of estimated velocities, influence of periodic signals
- Marker stability and antenna offsets

#### Documentation and meta-data?

- Need for proper management of meta data : duplicate station names, missing domes numbers
- Documentation of conventions used in analysis

# References

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