



Arbeitsgemeinschaft der Vermessungsverwaltungen  
der Länder der Bundesrepublik Deutschland

[www.adv-online.de](http://www.adv-online.de)



## National Report of Germany

- SAPOS® (open data, PPP-RTK)
- GNSS campaign 2021
- GNSS station FINO2
- Geodetic Observatory Wettzell

## EUREF Symposium 2021

Working Committee of the Surveying Authorities of the  
Laender of the Federal Republic of Germany (AdV)



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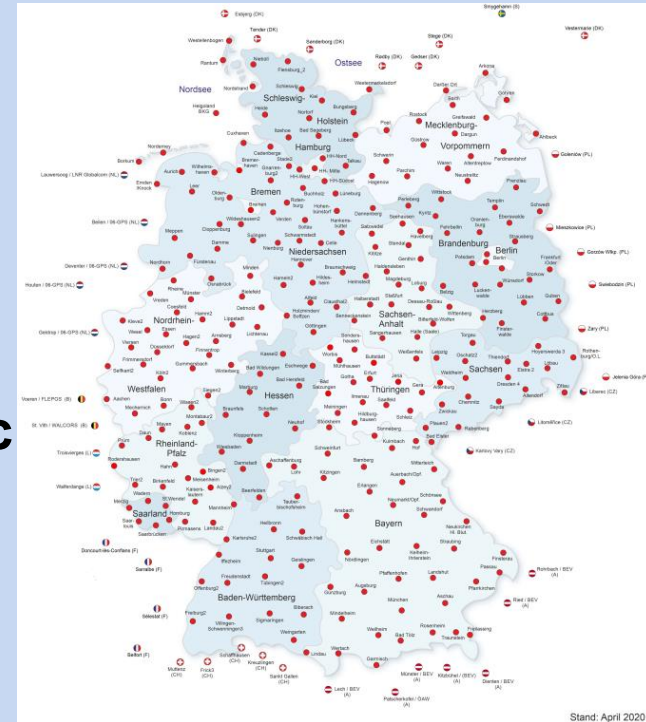
# critical infrastructure: SAPOS®

**SAPOS®** is a service operated by the Surveying Authorities of the States of the Federal Republic of Germany

**SAPOS®** provides the official spatial reference

**SAPOS®** is considered as an infrastructure basic provision and as part of the legal task of the German state survey

**SAPOS®** uses GPS, Galileo, GLONASS, BeiDou



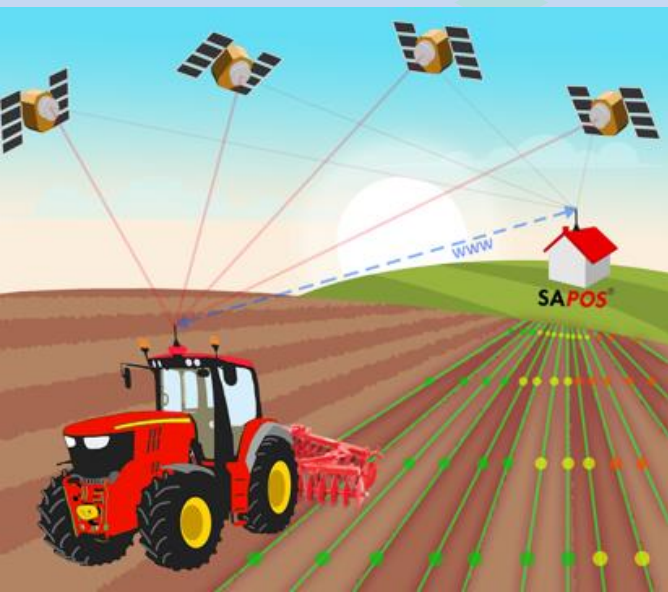
Stand: April 2020



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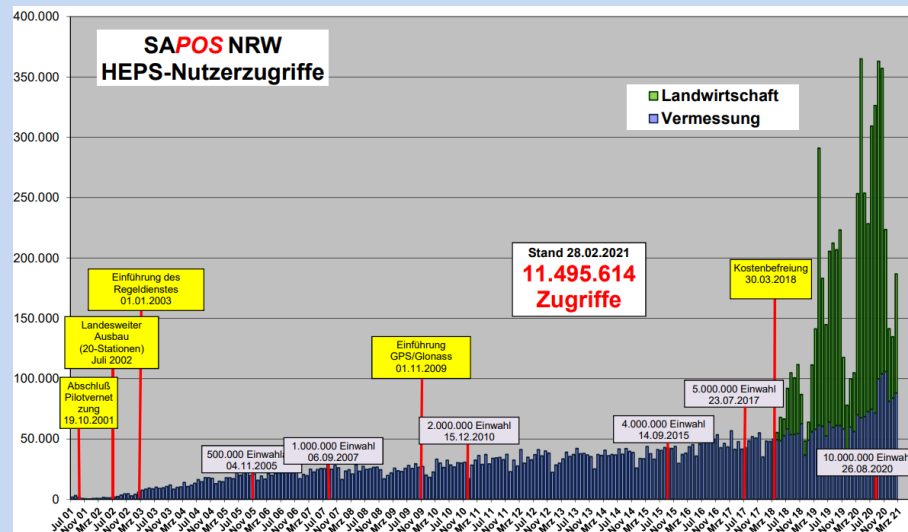
## Conference of the (German Laender) agricultural ministers, 31.03.2017

Topic future of agriculture – innovation and digitalization: demand for SAPOS as open data to develop the potential of smart farming



data to develop the potential of smart farming

In many German Laender SAPOS® is provided free of charge / open data



2/3 agricultural use

1/3 property surveys

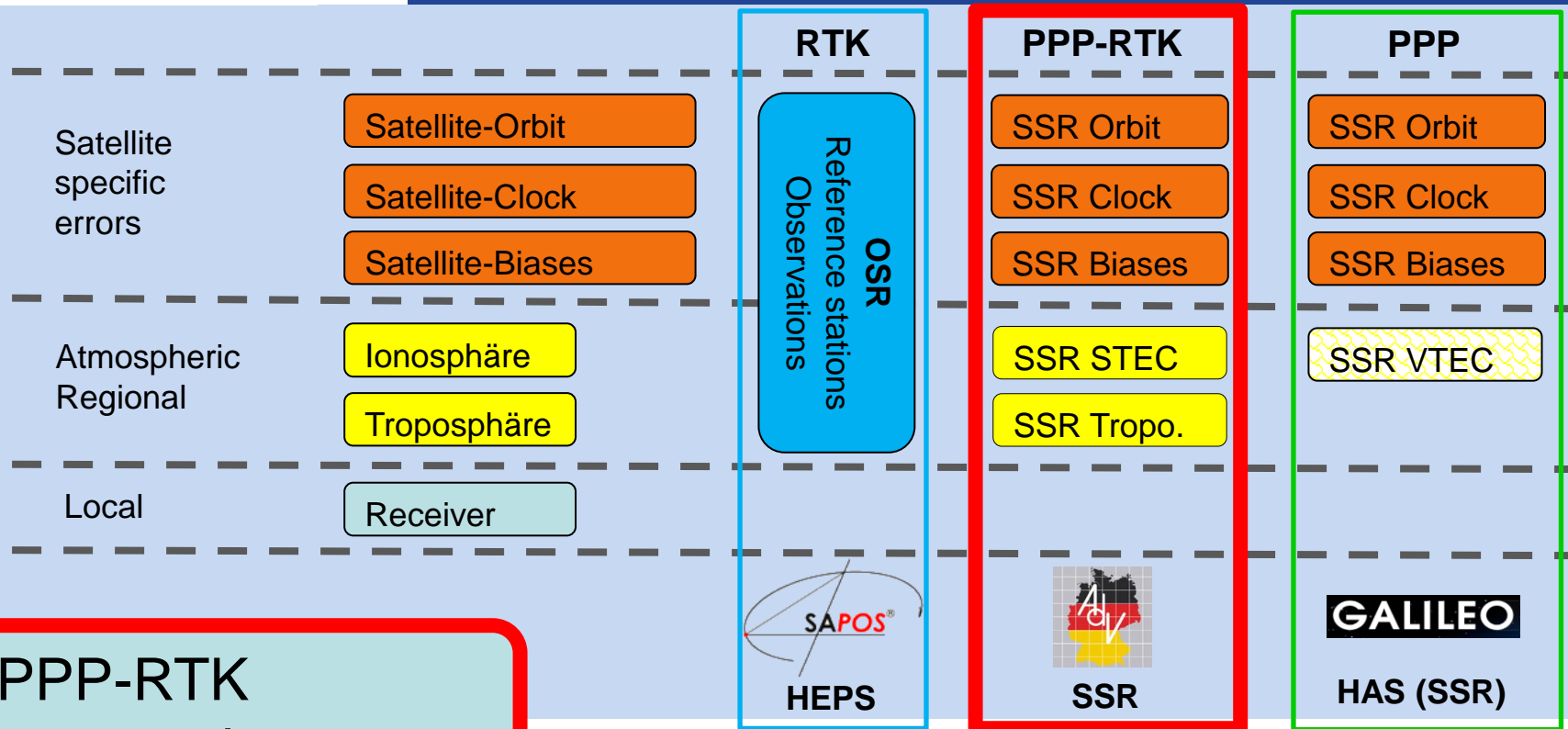


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# Real Time – Corrections for Precise GNSS-Positioning

## Observation Space Representation (OSR)

## State Space Representation (SSR)



PPP-RTK  
expected 2023+



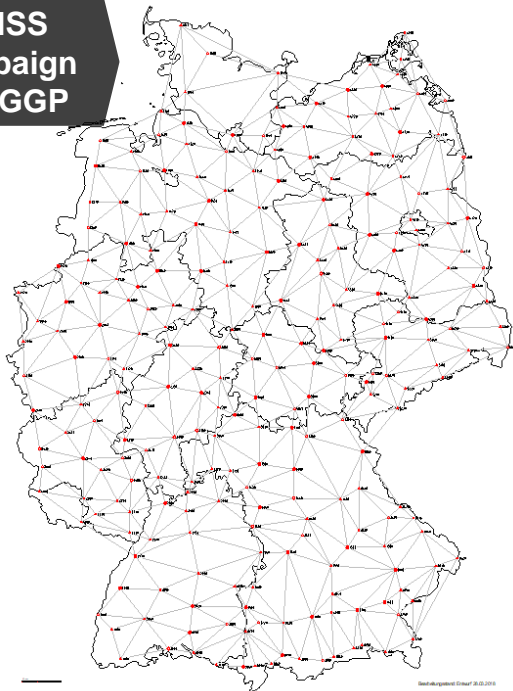
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# GNSS campaign 2021 & Reference Station Network (RSN) monitoring

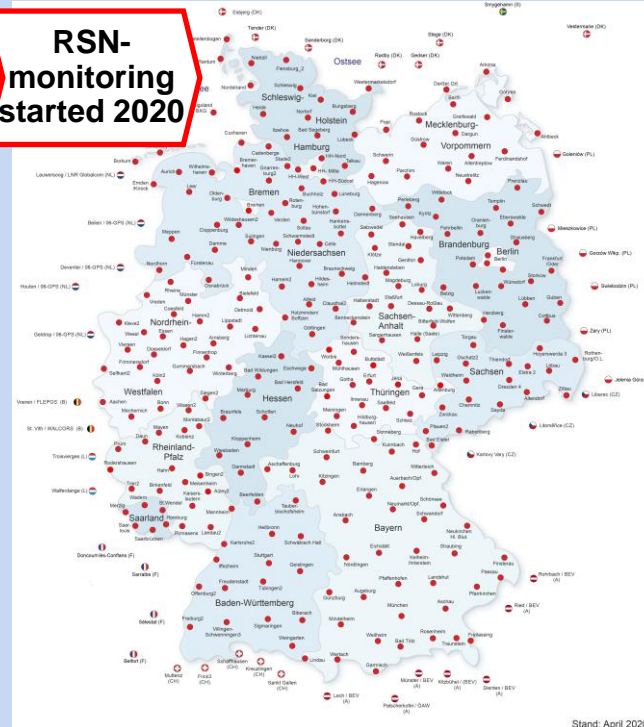
→  
**Integration of  
SAPOS network  
and the ground  
control point field  
(250 GGP)**

→  
**continuous  
monitoring of the  
geodetic  
infrastructure  
(RSN-monitoring)**

**GNSS  
campaign  
250 GGP**



**RSN-  
monitoring  
started 2020**



Stand: April 2020

AdV (2018): Dokumentation: “Die Erneuerung des Deutschen Haupthöhennetzes und der einheitliche integrierte geodätische Raumbezug 2016“ und Anlagen, <http://www.adv-online.de/AdV-Produkte/Integrierter-geodaetischer-Raumbezug/>



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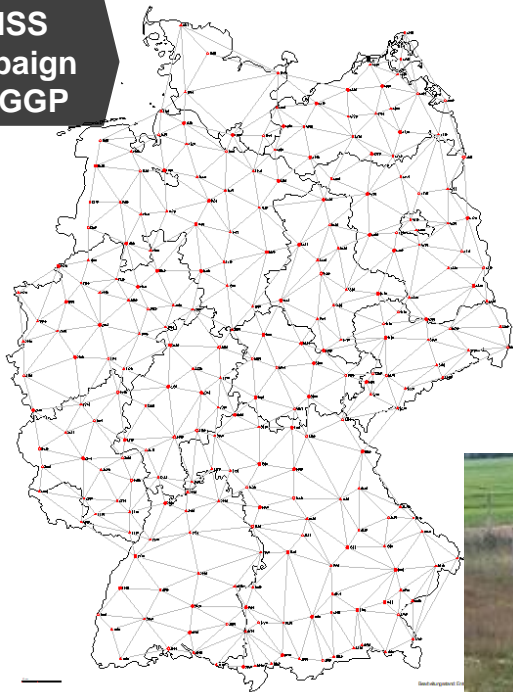
# GNSS campaign 2021 & Reference Station Network (RSN) monitoring

→  
**continuous  
monitoring  
(RSN monitoring)**

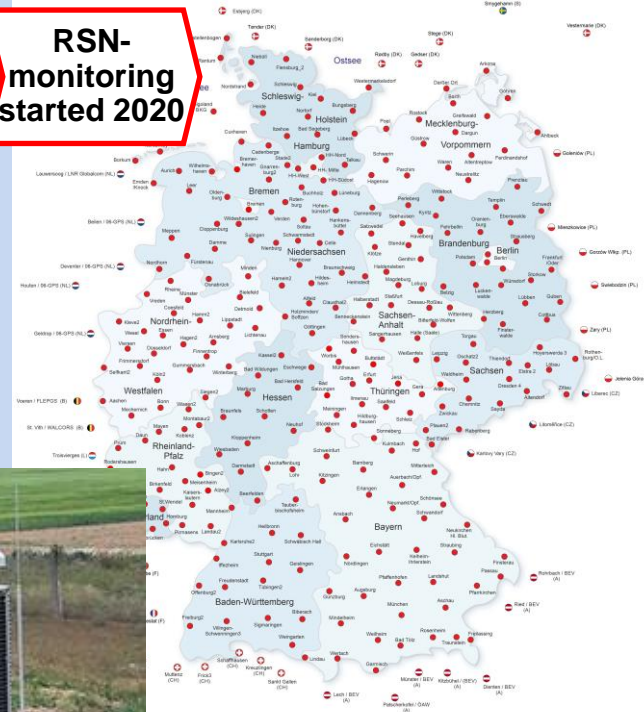
→  
**less need for  
terrestrial  
measurements**

→  
**demand for some  
reference stations  
on the ground**

**GNSS  
campaign  
250 GGP**



**RSN-  
monitoring  
started 2020**





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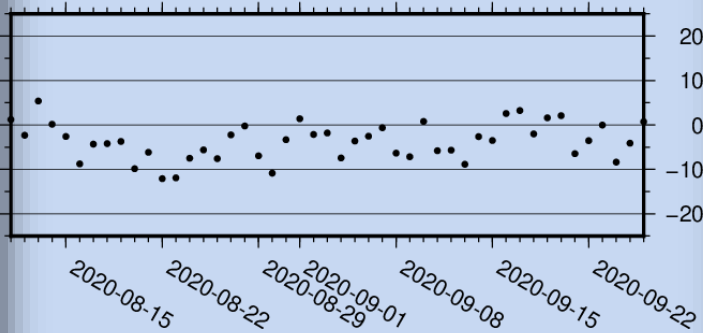
# GNSS and Radar Gauge at research platform station FINO2



## Research Platform in the Baltic Sea

### GREF-Stations

- GNSS
- Inclinometer
- Radar Gauge



- Positioning Service Monitoring
- Calibration point for Altimetry





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- **VLBI correlator: hardware installed, first test successful**
- **Galileo PRS: monitoring station is currently established**
- **5 m radio telescope for space weather observations: mechanical components are installed, normal operation will start end of 2021**
- **GOW as “critical infrastructure”**
  
- **Next: observation of space debris with laser ranging**

