

CNES/GRGS software of space geodesy

- **Installed on IBM computer at CNES with direct links from a few GRGS centres...**
- **With access to a secure and daily actualized data base on a CNES server (STAF)**
- **Installed as well on Dec- α at OCA (Grasse) and at ORB (Bruxelles) with a partial backup data base**
- **Available (under request) on PC with an INTERNET access to a centralized backup data base at OMP (Toulouse)**

Software

GIN :

1965

(Géodésie par Intégration Numérique)

GINs :

1994

(Géodésie par Intégrations Numériques Simultanées)

GINs-PC :

2007

Observations

Optique :

1962 - 1971 ($\sigma \sim 2''$)

TRANET :

1984 - 1987 ($\sigma \sim 2 \text{ mm/s}$)

Laser :*

1967 - ($\sigma \sim 15 \text{ m} - 2 \text{ mm}$)

Altimétrie / Xover* :*

1975 - ($\sigma \sim 20 - 1 \text{ cm}$)

DORIS :*

($\sigma \sim 0,3 - 0,1 \text{ mm/s}$) 1990 -

PRARE :

($\sigma \sim 1 \text{ cm} - 0,1 \text{ mm/s}$) 1994 - 2001

GPS :*

($\sigma \sim 1 \text{ cm} - 5 \text{ mm}$) 1992 -

VLBI :*

($\sigma \sim 1 \text{ cm} - 5 \text{ mm}$) 2000 -

GRACE KBR :*

($\sigma \sim 1 \mu\text{m} - 0,1 \mu\text{m/s}$) 2002 -

DSN :*

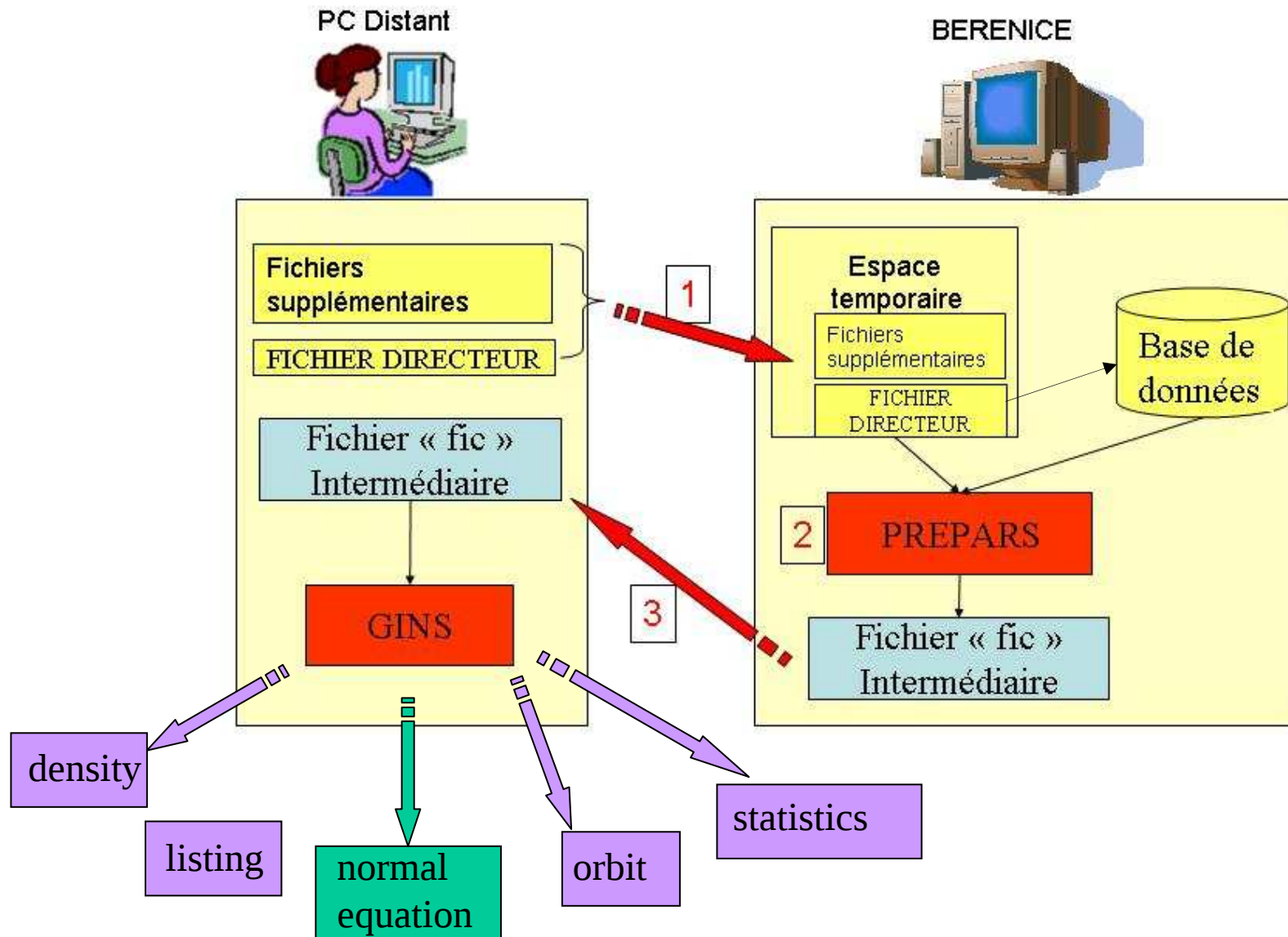
1970 - ($\sigma \sim .1 - .01 \text{ mm/s}$)

GOCE :*

($\sigma \sim 3 \text{ mE}$) 2008

(*: simulation possible)

GINS-PC: scheme of data flux



Functionalities :

- **Numerical orbit computation around any body of the solar system**
- **Determination of geodetic/geophysics parameters such as :**
 - *Gravity field harmonic coefficients*
 - *Ocean tides harmonic coefficients*
 - *Love's numbers*
 - *Mean sea surface (from altimetry)*
 - *Thermospheric coefficients (temperature, gas density)*
 - *Satellite thermo-optical coefficients*
 - *ERP and nutation parameters*
 - *Station position and velocities, geocenter*
 - ...

DYNAMO: example of EOP/TRF processing

