International Center for Earth Tides (ICET)

web: www.astro.oma.be/ICET/

Chair of the Directing Board: **Bernard Ducarme** (Belgium)

Terms of Reference and objectives

- As World Data Centre C, to collect all available measurements on Earth tides.
- To evaluate these data by convenient methods of analysis in order to reduce the very large amount of measurements to a limited number of parameters which should contain all the desired and needed geophysical information.
- To compare the data from different instruments and different stations distributed all over the world, evaluate their precision and accuracy from the point of view of internal errors as well as external errors;
- To help solving the basic problem of calibration by organizing reference stations or realizing calibration devices.
- To fill gaps in information and data;
- To build a data bank allowing immediate and easy comparison of earth tides parameters with different Earth models and other geodetic and geophysical parameters.
- To ensure a broad diffusion of the results and information to all interested laboratories and individual scientists.

These goals are achieved essentially by the diffusion of information and software, the data processing, the training of young scientists and the welcome of visiting scientists.

The recent achievements in modeling the response of the "solid" Earth to the tidal potential request to reach an higher accuracy in tidal observations in order to validate the competing models. It means instrumental calibration at the 0.1% level and precise elimination of the oceanic, atmospheric and hydrologic perturbations affecting the body tides. These goals can only be reached now in gravity tides with high precision instruments.

In parallel the interest for tiny geophysical signals still present in tidal residuals after subtracting the best available tidal model is increasing. It can be geoscientists trying to find core modes in continuous gravity registrations obtained by means of cryogenic gravimeters reaching a resolution of 0.1 nms^{-2} (10^{-11}g) and stability of the order of 10 nms^{-2} (10^{-9}g) per year. It can be volcanologists or seismologists looking for premonitory events in tilt or strain records. These two scientific communities have in common the fact that they are not yet trained in tidal data analysis.

As the groups interested by tidal phenomena are always very small and often only marginally involved in tidal research and as the papers dealing specifically with tidal studies are not fitting so well to international journals, it is still very important to keep a specialized diffusion and information medium. It is the vocation of the "Bulletin d'Information des Marées Terrestres" (BIM). ICET is publishing two eighty pages issues per year.

Data from about 360 worldwide tidal gravity stations: hourly values, main tidal waves obtained by least squares analyses, residual vectors, oceanic attraction and loading vectors. The Data Bank contains also data from tiltmeters and extensometers.
ICET is responsible for the Information System and Data Center of the Global Geodynamic Project (GGP).

Products

- Tidal Analysis Results (available on web-site or on request) for
  - station displacements.
  - gravimeters.
  - tiltmeters.
  - strainmeters.
  - barometers.
  - wells.
- Sofware (e.g. T-Soft, Tidal prediction, ETERNA, NSV, EDAT,…)
- Journal: Bulletin d'Information des Marées Terrestres (BIM)
- Bibliography (on web-site)
- Training of Scientists at ICET
- Organization of Summer schools.

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The International Centre for Earth Tides is one of the Federation of Astronomical and Geophysical Data Analysis Services (FAGS).