LITHOFLEX WORKSHOP

LithoFLEX theoretical background

STATOILHYDRO Research Centre Rotvoll

24-25 JUNE 2008 - Trondheim – Norway

Course-Program

Lecturers:

Carla Braitenberg[1],Jörg Ebbing[2],Susann Wienecke[3]

Laboratory Tutor: **Patrizia Mariani[1]**

[1]Department of Earth Sciences, Trieste University

[2]Geological Survey of Norway and NTNU Trondheim

[3] STATOILHYDRO Research Centre Rotvoll, Trondheim

StatoilHydro

LithoFLEX

Course Program

Day 1 Morning- theory (9:00-11:30)
9:00-9.-15: Welcome

9.15-10:15: **Part I: Theoretical background for gravity studies (CB)**
Theoretical background for gravity forward and inverse calculation by Parker approach. Role of the minimum wavelength in inversion. Parameter trade-off. Sensitivity study of parameters. Grace derived gravity field; GOCE satellite

10:15-10.30: Coffee

10:30-11:30: **Part II: Density-depth functions (JE)**
Density-depth functions in general and for sediments. Velocity-depth relation. Compaction models.

Day 1 Afternoon- practical (12:30-16:00)

12:30-13:15

-Data preparation. Useful grid sampling. Geosoft and Surfer Grid formats (JE)

14:00-…

Areas to be calculated: 1 - West Siberian Basin.

Introduction to grids: sediment, topography, gravity anomaly, Bouguer anomaly, Moho, seismic sections (Vyssotski). Sediment forward calculation. Testing different density-depth functions. Moho forward gravity calculation, Testing of parameters, gravity residual calculation

(2 - Backup example: South China Sea)

Day 2 Morning- theory (9:00-11:30)
9:00-9:30: **Part III Introduction to isostasy (SW)**

9:30-10:15: **Part IV Isostatic anomalies and basin evolution (JE)**
isostatic anomalies, local isostasy, Pratt model, McKenzie-rifting, Backstripping

10:15-10.30: Coffee

10:30-11:30: **Part V Regional flexure modelling (CB)**
Regional flexure modelling, full plate and broken plate model, Te constant and variable, Forward and inverse flexure calculations, Necessary constraints: crustal thickness and equivalent load, relative importance of internal loads and topographic loads (CB).

Day 2 Afternoon- practical (12:30-15:00)

equivalent total load calculation. Synthetic topographic generation. Flexure forward calculation. Continue flexure forward calculation, testing role of parameters. Flexure inverse calculation on a synthetic case.

Final Discussion.