controlled deposition of Miocene sediments and volcanoclastics, and deformed them. The minimum vertical throw associated with the flexure-system is approximately 1,000 m. A N5°E-trending, subvertical transcurrent-fault cutting Recent coluvial deposits, is associated with the shallow earthquake occurred on July 24, 2001 (Mw=6.3). In the north part of the study region, several landslides formed at the front of a W-NW-trending south-vergent thrust-fault. This structure is a transfer-fault between two of the flexures and it is still active. To the north, we correlate the described flexure-system, to the Moquella Flexure (Camiña valley), and at the latitude of Arica, to the Ausipar Thrust-fault and the Oxaya Anticline. To the south, it can be correlated to the Altos de Pica west-vergent thrust-system (latitude of Iquique). The west-vergent thrust-fault system along the Precordillera is, at least, 300 km long, is still active, can be followed in southern Perú, and accommodates the uplift of the western part of the Altiplano in this region.

T51A-1137 0830h POSTER

Pressure-Temperature-Time Relationships of Allochthons to Basement, Western Gneiss Region, Norway

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The Western Gneiss region of Norway contains one of the largest expanses of ultrahigh-pressure (UHP) rocks in the world. Our new findings of coesite pseudomorphs increase the known width of the UHP terrane to 100 km. In this same area, continental and oceanic allochthons are folded into the Baltica basement in complex patterns. To determine the role that the allochthons played in the UHP metamorphism, it is essential to understand the relationship of the allochthons to the Baltica basement. To this purpose, we have studied the temperature-pressure-time histories of the rocks along a 160 x 100 km E-W transect from orogen core to foreland.

Allochthon pelites (garnet + biotite ± kyanite ± staurolite) and garnet amphibolites record consistent pressures of ∼1.1 GPa across the entire transect; this contends earlier studies that implied a westward increasing P-T gradient. Temperatures are high, ranging from 650-800 °C. Basement rocks record similar temperatures but lower pressures (0.6-0.7 GPa). In situ eclogites in both allochthons and basement yield minimum pressures of ∼1.5 GPa, and a basement orthopyroxene eclogite yields about 3 GPa and 825 °C. While basement garnets are homogeneous, allochthon garnets display prograde zoning. All garnets show retrograde resorption, the effects of which were removed by recalculation using the Mn peak at garnet rims. The Gibbs method of Spear was used to model P-T paths for the rocks. Although the presence of in situ eclogites requires at least 0.4 GPa decompression of the allochthons, modeling of garnets across the area reveals only uniform heating and mild compression. We tentatively attribute the lack of decompression recorded in garnet zoning to resorption of garnets during decompression.

In summary, our observations suggest that: i) the eclogites formed in a relatively warm subduction zone; ii) the allochthon recrystallized as a subhorizontal sheet that stalled at lower crustal conditions (1.1 GPa) after exhumation from the subduction zone, and iii) the basement recrystallized at mid-crustal conditions (0.6 GPa) following a second stage of exhumation.

T51A-1138 0830h POSTER

The Ultrahigh-Pressure Rocks of Western Norway are Allochthonous

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The two paradigms most commonly invoked for the exhumation of ultrahighpressure (UHP) rocks involve large-scale extension: either the rocks are exhumed as a coherent entity in the footwall of a single extensional structure, or they are extruded as buoyant crustal slivers bounded by an extensional fault above and a contractional fault below.

UHP rocks in western Norway formed during the Caledonian collision between the Baltica and Laurentia continental plates in the Late Silurian/Early Devonian (425400 Ma). Previous tectonic models have assumed that the UHP rocks formed the leading edge of the Baltica margin, were subducted semi-intact to extreme depths of 135 km or more, and exhumed in the footwall of a large-scale extensional detachment, the NordfjordSogn Detachment (NSD).

However, our work in the Nordfjord area has revealed that at least the southern part of the UHP province, on the Stadlandet peninsula, lies above this detachment. Therefore, the UHP province is allochthonous with respect to the Baltica basement farther east (Western Gneiss Complex). If the late-orogenic extensional displacement along the NSD is removed, the UHP rocks are restored to a structurally higher position much farther inland, overlying the lower-pressure basement. Thus, the NordfjordSogn Detachment may have originally operated as a contractional fault during the collision, emplacing a wedge of the telescoped Baltica margin, with UHP conditions preserved at lower levels, back over the Baltica autochthon.

Recent mapping has shown that the NSD continues northeast from Nordfjord to the Geiranger area, where it turns south and links with an east-dipping shear zone. Therefore much of the Western Gneiss Complex north of Nordfjord, previously interpreted as autochthonous basement, also lies structurally above the NSD and may be part of the subducted Baltica margin thrust over the basement during the Caledonian orogeny.

T51A-1139 0830h POSTER

Sensitivity Analysis of a Gravity Inversion Model in Frenchman Flat Basin, Nevada

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Gravity inversion modeling is a common technique used in geophysics to determine the physical properties and geometry of geologic bodies. Such models are often sensitive to input parameters, but seldom are such sensitivities quantitatively explored.

A sensitivity analysis is performed for a gravity inversion model of the depth to the pre-Tertiary basement beneath Frenchman Flat, Nevada test site, Nevada. The gravity inversion model is a four-layer model, with each layer representing a laterally continuous slab of uniform density. The representative density values for each slab were estimated from well log data. The sensitivity analysis for the model is performed by slightly perturbing each layer of the model and converting the resulting change in depth to a percentage scale. The resulting 1% scaled sensitivities indicate approximately how much the model would change if a 1% change in an input parameter was made. The sensitivity analysis is used to identify critical inputs, quantitatively compare the change resulting from changes in each input, and identify the spatial distribution of the resulting change. Two factors influence the gravity inversion model for Frenchman Flat: the variance of the density of a given layer, based on the well data, and the sensitivity of the model to a selected change in the layer density. A high variance coupled with a high sensitivity to change will have the greatest effect on the model.

The sensitivity analysis in Frenchman Flat identifies the layers where a small change in density will have the greatest effect on the model, and where the greatest effects are located. Layer 2, for example, has sensitivity values greater than the other layers for a significant area of the basin, and layer 3 has sensitivity values roughly half that of the other layers.

Spatially, the layers do not influence the model output equally throughout the basin. The model is most sensitive to changes in density in layers 1 and 2 in the southwest part of the basin, and to changes in the density of layer 4 in the central part of the basin. These relationships occur because the southwest part of the basin is shallower and therefore dominated by the shallow layers of the model, whereas the deeper central part of the basin allows the dense lower layer to have a greater effect.

Once it is determined how sensitive the model is to a change in density in each layer, we can examine the possibility of a change in density by looking at the variation of density in the well log. Well log data indicate layers 1 and 2 have the greatest uncertainty in density, with an interquartile range roughly twice that of layers three and four. Layer 2, with its large uncertainty in density, relatively large spatial influence, and with the greatest sensitivity values, has the most influence on the model output.

With information about the influence of each parameter on the model output from the sensitivity analyses the modeler can focus directly on improving the data quality of the parameter that has the greatest effect on the model. In Frenchman Flat an extensive effort is underway to understand the geology and hydrology of the basin. Examples are given that highlight how this analysis will help focus future modeling efforts.

T51A-1140 0830h POSTER

Rates and Causes of Lateral Migration of Basin-floor Submarine Fans and Role of Mass Transport Complexes, Mid Eocene, Spanish Pyrenees

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Jordi Corregidor (00442076791325; ucfbktp@ucl.ac.uk)

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An integrated subsurface-outcrop study (Ainsa Project) shows for the first time the km-scale, less than 1 Myr, lateral migration of stacked Mid Eocene sandy basin-floor submarine fans away from the active South Pyrenean fold-and-thrust belt. Within fans, previously interpreted as slope channels, on a timescale of ca. 100,000 yr, individual channels show a higher resolution incremental lateral migration, ca. 200 m, away from the deformation front. Both depocenter migrations were driven by the tectonically-controlled internal deformation and progradation of the confining basin slope. This mobile slope intermittently collapsed to generate mass-transport complexes, MTCs, that not only formed much of the topographic template for each fan, but also contributed to their confinement. This depositional style provides a generic model for fan evolution within other active foreland basins and submarine trenches, and demonstrates the magnitude of tectonic control on basin-floor depositional processes.

T51B MCC: Hall C Friday 0830h

Tectonics and Structure of Tibet and China Posters

Presiding: **A J Martin,** University of Arizona**; B K Horton,** University of California, Los Angeles

T51B-1141 0830h POSTER

Upholding or fatally altering the boundary conditions for channel flow of the Southern Tibet middle crust

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Project INDEPTH results indicate a partially molten middle crust beneath southern Tibet. Recently, this has been suggested to be associated with ductile extrusion via channel flow bounded by coeval normal- and thrust-sense shear zones (the STDS & MCT respectively). Any orogenic thermal-mechanical channel flow model is highly sensitive to boundary conditions (i.e., to the "real" nature of the STDS and MCT). Characterising the geology of these boundaries is crucial to test whether channel flow may have operated and for how long. We present 3D data for the STDS.

The Southern Tibet Detachment System (STDS) is a series of normal sense shear zones in the structurally higher regions of the Himalayan orogenic wedge that have operated at a range of deformation conditions. Little- to un-metamorphosed Tethyan sedimentary rocks are juxtaposed upon sillimanite grade gneisses or mid-crustal leucogranites. In the area between Everest and eastern Bhutan, the predominant Tethyan rocktype juxtaposed by the STDS upon the crystallines is phyllite. This juxtaposition is also exposed 75-125 km to the north in the form of a series granitoid domes. The phyllites dome up where granite bodies approach or intersect the surface, yet the phyllites are intrusively cross-cut by the granites only infrequently and in very small volumes; the phyllites form an apparent barrier to granite ascent! INDEPTH data indicate that the phyllite-granitoid boundary is present throughout the southern Tibet plateau at depths of <15 km. The phyllites have a polyphase deformation history; they acted as the primary thrust detachment during the thin-skinned fold & thrust contraction during early collision before being reactivated as the normal sense shear zone (the STDS) - both senses of shear are preserved. We speculate that during normal sense displacement, the phyllite-bearing shear zone acted as a heat sink to temper upward displacement of granitic material thereby maintaining the upper boundary for effective channel flow. Later on, the loci of material displacement migrated downwards into the solidified granite thereby fatally altering the boundary conditions and stopping channel flow.

Carpathians (Vrancea): **V Mocanu**, A van der Hoeven, W Spakman, G Schmitt, B C Ambrosius

0830 h **T51A-1129** *POSTER* Proterozoic Blueschist-Bearing Melange in the Anti-Atlas Mountains, Morocco: Implications for Pan-African Subduction: **K P Hefferan**, J A Karson, H Admou, R Hilal, A Saquaque, T Juteau, M Bohn

0830 h **T51A-1130** *POSTER* Key Role of the Anaximander Mountains in the Neotectonic Evolution of the Eastern Mediterranean: J H ten Veen, **T A Zitter**, J M Woodside

0830 h **T51A-1131** *POSTER* Thermal Regime and Rheological Properties of the Ossa-Morena Zone and South Portuguese Zone, Iberian Massif, Southern Portugal: **C L Ellsworth**

0830 h **T51A-1132** *POSTER* An Integrated Study of the Holy Cross Mountains region of the Eastern European TESZ in Poland: **M G Averill**, T Bond, P Sroda, G R Keller, K Miller

0830 h **T51A-1133** *POSTER* Wilson Cycles and Strong Orogenic Belts: The Influence of the Paleozoic Ouachita Orogen on Mesozoic Opening of the Gulf of Mexico: **D L Harry**, A D Huerta

0830 h **T51A-1134** *POSTER* Developing a Geothermal Indicator Index From Crustal Geophysical Data for the Western Great Basin: **W A Thelen**, S B Smith, J N Louie, A Concha-Dimas

0830 h **T51A-1135** *POSTER* Numerical modeling of creep in high-contrast Maxwell solids: **R C Bailey**

0830 h **T51A-1136** *POSTER* Active Late Cenozoic Flexures in the Precordillera in Northern Chile: Correlations With the Shallow Seismic Activity, and Implications for the Uplift of the Altiplano: M Farias, R Charrier, **D Comte**, J Martinod, L Pinto, G Herail

0830 h **T51A-1137** *POSTER* Pressure-Temperature-Time Relationships of Allochthons to Basement, Western Gneiss Region, Norway: **E O Walsh**, B R Hacker

0830 h **T51A-1138** *POSTER* The Ultrahigh-Pressure Rocks of Western Norway are Allochthonous: **D Young**, B Hacker, T Andersen

0830 h **T51A-1139** *POSTER* Sensitivity Analysis of a Gravity Inversion Model in Frenchman Flat Basin, Nevada: **G Phelps**

0830 h **T51A-1140** *POSTER* Rates and Causes of Lateral Migration of Basin-floor Submarine Fans and Role of Mass Transport Complexes, Mid Eocene, Spanish Pyrenees: **K T Pickering**, J Corregidor

T51B MCC: Hall C Friday 0830h
Tectonics and Structure of Tibet and China Posters

Presiding: **A J Martin**, University of Arizona; **B K Horton**, University of California, Los Angeles

0830 h **T51B-1141** *POSTER* Upholding or fatally altering the boundary conditions for channel flow of the Southern Tibet middle crust: **M EDWARDS**, W Kidd

0830 h **T51B-1142** *POSTER* Differentiating Between Models of MCT Evolution in the Annapurna Range, Central Nepal Himalaya: **A J Martin**, P G DeCelles, P Patchett, C Isachsen, G E Gehrels

0830 h **T51B-1143** *POSTER* Geologic Evolution of the Gyala Peri Massif, Southeastern Tibet: **W Kidd**, P Zeitler, A Meltzer, C Lim, C Chamberlain, L Zheng, Q Geng, Z Tang

0830 h **T51B-1144** *POSTER* Structural Constraints on the Evolution of the Nyainqentanglha Massif, Southeastern Tibet: **J Kapp**, M Harrison, M Grove, P Kapp, L Ding, O Lovera

0830 h **T51B-1145** *POSTER* Ophiolitic Melanges in the Yarlung-Tsangpo "Big Bend" Canyon, SE Tibet: Q Geng, **L Zheng**, G Pan, C Ou, Z Sun, H Dong, X Wang, Y Liu, S Li

0830 h **T51B-1146** *POSTER* The Crustal Structure of Central Tibet Based on Local Earthquake Records and a Reinterpretation of Seismic Data Along the INDEPTH III Profile: R Meissner, **F Tilmann**, S Haines, J Mechie

0830 h **T51B-1147** *POSTER* Timing and Rates of Quaternary normal2 Faulting in Central Tibet: **P M Blisniuk**, W D Sharp

0830 h **T51B-1148** *POSTER* Cretaceous to Tertiary Vertical-Axis Tectonic Rotations of Northeastern Tibet From Preliminary Paleomagnetic Results: **G Dupont-Nivet**, B K Horton, R F Butler, J Wang, J Zhou, H Zhang

0830 h **T51B-1149** *POSTER* Improved Age Constraints for Mesozoic and Cenozoic Basin Development in Northeastern Tibet Based on Magnetostratigraphy and Palynology: **B K Horton**, G Dupont-Nivet, J Zhou, G L Waanders, R F Butler, J Wang, H Zhang

0830 h **T51B-1150** *POSTER* Geology of the Northeastern Nyainqentanglha Range, Central Tibet: **Y Li**, W Kidd, K D Nelson, H Xia, M Edwards, L Ratschbacher, Z Jiang, W Jiang, Z Wu

0830 h **T51B-1151** *POSTER* Early Tertiary Sedimentation and Crustal Deformation Recorded in the Gonje Basin, Eastern Tibet: **C Studnicki-Gizbert**, B Burchfiel, Z Li

0830 h **T51B-1152** *POSTER* GPS Monitoring of Crustal Deformation in Eastern Tibetan Plateau: **Y Liu**, Z Chen, W Tang, J Zhao, Q Zhang, X Zhang, B C Burchfiel, R W King, L H Royden

0830 h **T51B-1153** *POSTER* Active Deformation in Central Tibet: Constraints from InSAR and Geologic Observations: **M Taylor**, G Peltzer, A Yin, F J Ryerson, R Finkel, D Lin

0830 h **T51B-1154** *POSTER* How Does the Kunlun Fault End?: **E Kirby**

0830 h **T51B-1155** *POSTER* Tectonics in East Asia : Contiunous or block-wise?: **M Iwakuni**, T Kato, S Miyazaki, W Sun

0830 h **T51B-1156** *POSTER* Kinematics and structures of the ultra-high-pressure Sulu terrane, eastern China: **L E Webb**, M L Leech, T Yang, Z Xu

0830 h **T51B-1157** *POSTER* Extensional collapse of a Mesozoic intraplate fold-and-thrust belt, Daqing Shan, Inner Mongolia, China: **B J Darby**, G A Davis, Y Zheng

0830 h **T51B-1158** *POSTER* Tertiary Shortening along the Eastern Portion of the North Qaidam Thrust System: **A C Robinson**, A Yin, C A Menold, X Chen, W X Feng

0830 h **T51B-1159** *POSTER* Tectonic Evolution of the North Qaidam UHP Complex, Western China: **C A Menold**, C E Manning, Y An, R C Alex, X Chen

0830 h **T51B-1160** *POSTER* The ICDP Information Network and the Chinese Continental Scientific Drilling CCSD: **R Conze**, D Su

0830 h **T51B-1161** *POSTER* Paleozoic and Cenozoic Tectonic Evolution of the Russian and Chinese Altai Mountains: A Preliminary Report: **S M Briggs**, A Yin, C E Manning, A G Vladimirov

0830 h **T51B-1162** *POSTER* The 1971 Artyk Earthquake: Is the Locus of Motion Changing in Northeast Russia?: **K Fujita**, M S McLean, K G Mackey, B M Kozmin

T51C MCC: Hall C Friday 0830h
Neotectonics Posters

Presiding: **D D Bowman**, California State University, Fullerton; **C P Huebscher**, Institute of Geophysics University of Hamburg

0830 h **T51C-1163** *POSTER* Evidence for Quaternary Faulting Along the Apricena Tectonic Lineament (Gargano Area, Italy): **F Cinti**, F Doumaz, J J Young, M Moro, S Salvi, L Colini, S Pierdominici

0830 h **T51C-1164** *POSTER* Raised Marine Terraces in the Sibari Plain (Calabria, Southern Italy): the Geological Record of Fast Regional Uplift and Local Fault Deformation: **L Cucci**

2002
Fall Meeting Program and Abstracts

AGU FALL MEETING

SAN FRANCISCO
6-10 December

This CD-ROM contains the program and abstracts of the 2002 Fall Meeting. The information is stored in both HTML and PDF formats as browsable tables and a searchable database. The CD-ROM is designed to run on Windows and Macintosh platforms.

Software Requirements

A version 4.* or later WWW browser (Netscape Navigator or MS Internet Explorer) with Java support is required to browse and search the abstracts. It is recommended to use the latest available browser release. To view, print or search the PDF files, the Adobe Acrobat Reader is required. To download, go to:
http://www.adobe.com/products/acrobat/readstep2.html

Installation Instructions

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MACINTOSH

If your File Sharing Control Panel is configured to run the correct helper applications, the default page index.htm will be loaded automatically in the browser when the CD is inserted into the CD ROM drive. Otherwise, do the following:

1. Select "Run" to run MacStart script when prompted after inserting CD.
2. Choose Stuffit Expander to open Go.hqx (this starts Java console which will say "Waiting for client's request !!!").
3. Click the CD icon on the desktop and open index.htm in the browser.

Note for Macintosh OS X users: Refer to the README.txt file on the CD-ROM.

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As an alternative, a searchable index of the collection of session PDF files is included. See README.txt on the CD-ROM for more details.

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Abstracts should be cited as

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