monttreppen, über deren genetische Voraussetzungen in der Literatur kaum etwas ausgesagt wird, erscheint daher höchst zweifelhaft. Die überwiegende Zahl der Autoren, die sich mit dem Altrelief der Karbonatstöcke auseinandergesetzt haben, selbst Spezialisten der Karstforschung, gehen von einem unverkarstetem Raxrelief aus, das erst nach Ausbildung der Verebnungen der Verkarstung unterlag. Dieser Annahme fehlt jedoch die Untermauerung. Allerdings hat die Altlandschaft eine differenzierte Umgestaltung durch weiterlaufende Korrosionsprozesse und Glazialerosion erfahren.

Meteorologische Parameter ermittelt aus dem Österreichischen GPS-Permanentnetz

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In den vergangenen Jahren wurde in Österreich durch verschiedene Betreiber ein dichtes GPS-Permanentnetz aufgebaut (Punktabstand ~ 50 km). Bisher war die Nutzung der Messdaten der GPS-Referenzstationen auf die geodätische Positionierung und diverse Navigationsaufgaben beschränkt. Die Brechung der GPS-Signale in der Troposphäre und der Ionosphäre wird als Störgröße behandelt und durch geeignete Auswertestrategien eliminiert oder wenigstens reduziert.

Für die Meteorologen sind hauptsächlich die unteren 10 km der Troposphäre (Feuchtanteil) für Wettervorhersagen von Bedeutung. Seit wenigen Jahren versucht man deshalb das Verfahren zu invertieren und das hohe Genauigkeitspotential der Messgrößen zur Beobachtung der Atmosphäre heranzuziehen. Man nutzt die Kenntnis der hochgenauen Stationskoordinaten, als auch der GPS-Bahndaten, um die troposphärische Verzögerung als Unbekannte zu berechnen. Weiters erlauben genaue Messungen von Druck und Temperatur an der Bodenstation den hydrostatischen Anteil vom Feuchtanteil zu trennen, woraus der IWV (Integrated Water Vapour) berechnet werden kann.

Der Nachteil gegenüber den üblichen Ballonsondenmessungen liegt in der schlechten vertikalen Auflösung. Demgegenüber stehen aber sowohl die hohe zeitliche (30 min bzw. 1 Stunde) als auch räumliche Auflösung (horizontal alle 50 km) der Schätzwerte.

Unser Ziel ist es, aus den kontinuierlichen Messungen des österreichischen Permanentnetzes meteorologische Parameter in Beinahe-Echtzeit für numerische Wettervorhersagen abzuleiten. Dies verlangt einen raschen Datenfluß, präzise Satellitenbahnen in beinahe Echtzeit (IGS) und eine Automatisierung der GPS-Auswertung mit Hilfe der Berner Software.

In dieser Arbeit werden für zwei Wochen im Jänner 2002 ZPD berechnet und mit Ergebnissen von Auswertezentren, die im Rahmen des COST-716 Projekts „Exploitation of Ground Based GPS for Climate and NWP“ entstanden, verglichen.

Geology of the Bohemian Massif - a gordian knot

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The Bohemian Massif (BM) is the most complex part of the European Variscides. It contains a terrane collage of three Armorican “islands” (Franconia, Saxo-Thuringia, Bohemia) and northern Gondwana. Evolution of the BM implies tectonic deformation at three subduction/collision zones, polyphase Devonian and Carboniferous metamorphism, and important late orogenic faulting, both across and along the main structural trend.

Recent studies have established plausible correlations between the German part of the BM and the Sudetes. The Mid-German Crystalline High and the Saxothuringian Basin can be traced eastwards around the Teplá-Barrandian block. The apparent curvature of the belt of c. 90° was brought about by some rotation combined with important dextral, NW-trending faults (Elbe and Intra-Sudetic fault zones). All these structural elements are cut off by the “Moldanubian Thrust” (MT), a crustal scale shear zone characterized by dextral transpression. The Moravo-Silesian Belt (MS) to the SE of the MT is a palaeogeographic equivalent of the Rheno-Hercynian Zone, and was rotated through ≥ 90° with respect to the latter.

Distance of transport along the MT probably attained the dimension of hundreds of kilometres. This is impossible in the present position of the MT: displacements of this magnitude would either imply important overthrusting of the central Variscides over Baltica, or else southwestward movement of the MS, producing an extensional belt between the MS and Baltica. None of these features can be demonstrated. Long-distance transport along the MT is only possible in a position at the southern margin of Baltica, where dextral strike slip along NE-trending faults was unimpeded. This concept implies a later, dextral displacement of the MT along the southwestern margin of Baltica with a distance of transport of c. 1.000 km. NW/SE shortening after the activity of the MT amounts to at least 400 km; options for the remaining 600 km will be discussed.

The Variscides are a very "hot" orogen: the crystalline parts of the BM are characterized by HT metamorphism, first at high, later at low pressures, and by a large volume of granites. Possible reasons include stacking of radiogenic crust and slab break-off (or related processes). Hot and low-viscosity rocks were extruded from mantle depths into higher structural levels, and partly transported as thrust sheets over the foreland. Sedimentary evidence argues against a Tibetan style plateau, which subsided into the soft substrate. Expulsion of low viscosity rocks was probably brought about by the lithostatic pressure gradient between the orogenic root and the foreland. Heating of higher crustal levels was mainly brought about by the advection of granite melts. One prime example is the "SW-Moldanubian Transverse Zone", a NW-trending belt of HP/LT metamorphism, which cuts across the Variscan sutures.

Further progress in our understanding of the BM can only be obtained "in the hard way", ie, by precise isotopic dating of granitoids and metamorphic events.

Spatial Distribution of Historical Building Material in South Tyrol

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Regional conservation strategies are based on the knowledge about the material used, its distribution and qualities. A combined study on the material inventory of churches in South Tyrol/Italy as well as on the properties and weathering behaviour of prominent building materials of that area was conducted.

The first part of the study was concerned with mapping on a regional scale aiming at the documentation of historic building materials and a survey of its distribution. In order to document all information in one map a spectrum of symbols has been developed which allows to distinguish the kind of constructions (church, chapel, house, castle, memorial, tombstone, wall etc.) architectural elements (base, wall, tower, roof, door, window, decoration elements etc.), and materials (stone, brick, mortar, masonry etc.). This scheme provides a comprehensive survey of relevant material data useable as primary information source for conservation and restoration concepts.

The results of this mapping survey suggest a very close correlation between stone materials employed for historic objects and the local geology. This applies particularly for more remote valley areas. Petrographic mapping reveals in addition in many cases a close correlation between the functional construction task and the choice of materials. This fact is additionally constrained by the local availability of materials. The data allows to distinguish five stone provinces.

i) Northern Granitic province - Eissack - Pusteria Valley; ii) Sandstone province – Etsch Valley area (Bozen-Meran) with overlap in the Unterland, where Gröden Sandstone shows a variable weathering behaviour. iii) Porphyry province - collateral to the Sandstone province. iv) Marble province - middle Vinschgau area where mainly Laas marble was used [2]. v) Gneiss province - upper Vinschgau area.

A yet unsolved problem is where the stone materials for the different objects have actually been quarried. Very little documentation about that is available.

The second part of the study is concerned with the determination of basic petrographical, chemical and physical parameters, such as mineralogy, sedimentary fabrics, salt content, pore and hygric properties of the main materials. Weathering simulation experiments augment the data body about on weathering behaviour. The major problem in this study is the considerable material variation (especially within the sandstones) in combination with a broad spectrum of climatic/ environmental factors. This requires long term monitoring of the climatic/environmental impact factors on building materials. However, the available data is still scarce.

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