commonly known as Gosau basins in the Eastern Alps, in all parts of the ABCD belt. Similar collapse basins occur all along the northern, Alpine-Carpathian-Balkan strand as well as in Dinarides. Common features include: (1) age postdating oceanic, Meliata - Vardar, closure; (2) an age postdating the formation of the Cretaceous-aged nappe stack and peak conditions of the Early Alpine metamorphism; (3) synchroneity with exhumation of metamorphic orogenic wedge and exhumation of metamorphic core complexes as well as of previously subducted continental crust; and (4) deposition of high proportions of siliciclastic material reflecting relief, exhumation and denudation of metamorphic crust. In the eastern part of the Carpathian-Balkan strand, these Gosau basins are associated with a linear belt of calcalkaline volcanic and shallow-plutonic successions known as Banatite Suite. A lateral diachroneity in onset is observed.

A summary of existing and new own Ar-Ar single-grain age data from these Gosau basins covering the entire ABCD-belt reveals a direct connection with exhuming metamorphic crust. The proportion of Cretaceous-aged white mica is high in the west, and low in the existing reflecting the exhumation of the high-pressure belt in Alps and Apuseni Mountains.

The Meliata/Vardar oceanic basin started to close during the Middle Jurassic. The final closure of the Meliata basin occurred during the Early Cretaceous with the formation of a deep sea trench. The overall process is A-subduction and high-pressure metamorphism of the distal Austroalpine continental margin, and subsequent exhumation of high-pressure rocks and in overall transpressional setting. Geochronologic data monitor continuous footwall accretion of cover and basement/cover nappes between 120 and 50 Ma. Late Cretaceous Gosau basins seal the Meliata suture and nappe stacking structures. Formation of these basins in the Eastern Alps was associated with sinistral wrenching, northward tilting of the orogenic wedge, normal faulting at shallow crustal levels and exhumation of eclogite-bearing crust within Austroalpine units. A model with trench retreat of the subducting Austroalpine/Penninic lithosphere can explain exhumation of high-pressure rocks, accretion of subducting material and subsidence in the upper plate, where Gosau-type basins formed.

Geochemical characteristics of the Miocene Volcanism in SE Styria, Austria

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The Styrian basin, the westernmost sub-basin of the Pannonian basin system, is located at the eastern margin of the Eastern Alps. The majority of the studied samples were revealed by drilling cores in the southeastern part of the Styrian Basin. The rest of the samples have been collected from quarries.

The rocks are high-K calc-alkaline (andesites and dacites) and alkaline (latites and shoshonites). K/Ar-ages range from 16.3 to 13 Ma with high-K calc-alkaline rocks representing the oldest suite. A striking petrographic difference between both groups is that the calc-alkaline rocks are amphibole bearing and lack of clinopyroxene. Some zoned clinopyroxenes from the alkaline rocks have magmatic corroded cores overgrown by more basic rims suggesting basic magma reflux.

In the spiderdiagrams all the samples show remarkable negative Nb and Ta troughs and high contents of LILE. Additionally the clalc-alkaline rocks have negative P anomaly. However, the calc-alkaline rocks are characterized by low contents of LILE and HFSE when compared to the alkaline rocks.

The calc-alkaline rocks from Styria are similar to those from the Carpathian-Pannonian area that have long been recognized as being typical for subduction related-magmas (Seghedi et al. 2004). They can be modelled by an AFC-process controlling the composition of an IAB-magma with F=0.6 and r=0.4. As contaminant is proposed the upper continental crust.

While high-K calc alkaline rocks can be explained by an AFC-process the composition of the alkaline rocks (latites and shoshonites) seems to be a consequence of batch melting processes of a pre-enriched mantle, which can be derived by mixing of primitive lithospheric mantle with material from the continental crust. Model calculations reveal that the fraction of continental material in the mixture was 4% and the batch melting process took place in the stability field of spinel-lherzolite at 5%.

From the geodynamical point of view, the calc-alkaline lavas can be seen as a consequence of the subduction of the Rhenodanubian-flysch or the subduction of the West-Carpathian-Flysch. This subduction was related to the N-S convergence of Africa and Europe in the Early Miocene. In contrast the alkaline magmatism was the result of decompressional melting of a metasomatic pre-enriched mantle. The process of decompresional melting may be related to the extension that characterizes the western margin of the Pannonian Basin during the Middle Miocene (Seghedi et al. 2004).

Seghedi, I., Downes, H., Szakacs, A., Mason, P.R.D., Thirwall, M.F., Rosu, E., Pecskay, Z., Marton, E. & Panaiotu C. (2004): Neogene-Quaternary magmatism and geodynamics in the Carpathian-Pannonian region: a synthesis. - Lithos, **72**: 117-146.

Multiple Particle Interactions

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A mathematical model is developed to account for the rotational disturbances of rigid ellipsoids caused by interactions between neighbours. The equations of motion of rigid particles in isolation are adapted via the Kuramoto model which implements synchronisation among the set of interacting particles. The orientation of the ellipsoids is determined by three angles (the Euler angles) which in turn determine the angular velocity at any point in time. Rather than adjusting the perturbed velocity field, a noise term is appended to the equations that determine the angular velocity. This term depends on the neighbouring particles' degree of coupling, proximity and relative position. Simulations reveal a preferred orientation at an angle to the shear direction that increases with the degree of coupling.

Slump structures and paleoslope: Case study in pelagic limestones of the Ammergau Formation, Ampelsbach gorge, Northern Calcareous Alps, Tyrol, Austria

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One method to estimate paleoslope orientation is to study and interpret slump folds. Existing methods for analysis of slump structures require collection of orientation data on a scale similar