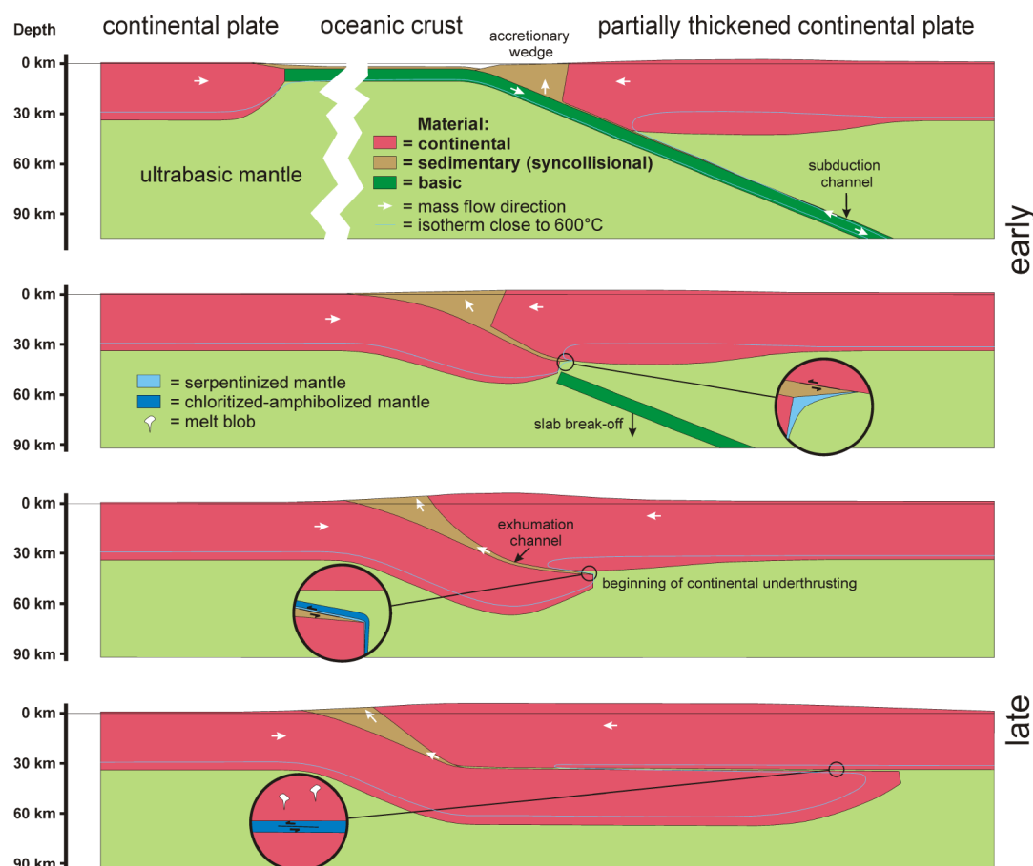


# How did continental plates collide in Proterozoic and Phanerozoic times?

*Prof. Dr. Hans-Joachim Massonne*

(School of Earth Sciences, China University of Geosciences, Wuhan)

The results of numerical modeling point to deep subduction of continental crust during the collision of lithospheric plates. However, little evidence exists for this process. Thus, the old-fashioned alternative is revived, namely duplication of continental crust during orogenesis. This process is demonstrated to be enabled by the capability of the upper crust to release large amounts of water during early burial accompanied by heating. This water hydrates the mantle when the downgoing crust comes in contact with it. Hydrated mantle is rheologically weak and allows the lower continental plate to penetrate it considerably. Whereas this process relates only to continental crust in the Phanerozoic, also oceanic crust was underthrust (not subducted!) in this way in the Precambrian. During the underthrust process large volumes of different TTG-melts were produced at the water-rich interface between underthrust oceanic crust and overlying lower crust of the upper plate. Thus, the typical appearance of denuded ancient orogenic crust is produced showing crystallized TTG melts and medium- to high-grade metamorphic rocks.



Hans-Joachim Massonne is Distinguished Professor (short term) at China University of Geosciences at Wuhan since this year and was before director at the Institut für Mineralogie und Kristallchemie at Universität Stuttgart for more than 20 years. He has special interest in the metamorphic evolution of high-pressure rocks and its geodynamic consequences.