



## **Transient, syn-obduction exhumation of Zagros blueschists inferred from P-T-d-t and kinematic constraints: implications for wedge dynamics**

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We present the first quantitative results of the only known blueschist (BS) facies rocks present in Zagros (Hajiabad area). The BS crop out as five kilometre-scale bodies within the extensive coloured melange units, which mark discontinuously the Neotethyan suture zone. The BS were underplated below the Sanandaj-Sirjan zone and always crop out within a serpentinite-rich matrix which is likely to have facilitated their exhumation. P-T estimates using Thermocalc, Tweequ and Raman spectroscopy of carbonaceous material, point to HP-LT conditions around 11 kbars and 520-530°C, that is along a c. 15°C/km gradient. In-situ laser-probe <sup>40</sup>Ar-<sup>39</sup>Ar radiometric age constraints on phengite cluster between 85 and 95 Ma, with a scatter up to 120 Ma. During the period 115-85 Ma, convergence velocities doubled (to c. 5-6 cm/a) and convergence obliquity was lower than 20° across the Neotethyan subduction zone below Iran. These age constraints for Zagros BS are also 5-10 Ma older than age constraints for the nearby HP-LT metamorphism in Oman. Syn-convergence exhumation of Zagros BS to depths < 15-20 km was in any case accomplished before 80 Ma. It is shown that their exhumation corresponded to a transient process coeval with high convergence velocities and obduction movements (c. 100-80 Ma). We propose that the mechanical coupling across the Neotethyan subduction below Iran was modified by this large-scale plate rearrangement, allowing for a temporary exhumation of Zagros BS. This process ceased at the end of obduction, when the subduction of the Arabian continental margin stopped.