Fig. 1. Equal-area plots for different methods of ó1-determination based on one-fault inversion: Angelier-Mechler's method ($\mu \le 1$), descripted method (variable μ, e.g., $\mu \le 0.2$), Arthaud's method ($\mu = -1$, no solution in this case).

Fig. 2. Equal-area plots of distribution s1 and s3 showing field reduction in dependence on μ_{min} and μ_{max}: a – one fault, ó$_1$-plot with mmin isolines; b – ó$_1$-plot of mmin for two faults from Fig. 1; c – ó$_3$-plot of mmax for the same faults. Isolines of μ: −1.0, −0.9, −0.8, −0.6, −0.3, 0, 0.3, 0.6, 0.8, 0.9, 1.0.

od (Angelier and Mechler, 1977) and M-plane method (Arthaud 1969). These two methods are the two marginal cases of general inverse method based on one-fault inverse analysis.

Using fault coordinate system, where l-axis is striae lineation, n-axis is normal to fault plane and m-axis complete right-hand orthogonal system lmn, it is easy to derive equation for Lode parameter $\mu = (2ó_2 - ó_1 - ó_3)/(ó_1 - ó_3)$ in dependence on direction of ó$_1$ and ó$_3$ respectively. This function limits field of possible ó$_1$-directions with decreasing of mmax (Fig. 2a) and ó$_3$-field with increasing of mmin. The field of ó$_1$ is equivalent to right dihedra quadrant for $\mu \le 1$ as one extreme and is reduced to part of M-plane for $\mu = -1$ as the second extreme (Fig. 1). Base on this idea we can make equal-area plot for fields of ó$_1$ and ó$_3$ with isolines of μ (Fig. 2b, c). With these plots we can determine upper and lower limits of μ (μ_{max}, μ_{min}), and corresponding fields of ó$_1$ and ó$_3$ respectively.

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CELEBRATION 2000: P-Wave Velocity Models of the Bohemian Massif

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In the framework of Celebration 2000 seismic refraction project, an international scientific experiment aimed at investigation of deep lithospheric structure of Central Europe, regions with different tectonic development such as Precambrian East European Craton, Trans-European Suture Zone, Carpathian Belt, Bohemian Massif and Pannonian basin can be studied. The fieldwork for the project was completed in June 2000, when 147 shots were fired along most of the recording profiles with total length of about 8900 km, which resulted in obtaining of 160,000 seismic records.

The region of the Bohemian Massif was studied along two refraction profiles, CEL09 and CEL10, crossing the territory of the Massif and enabling to study its contact with neighbouring tectonic units. The respective seismic sections on the profiles in the Bohemian Massif show good quality recordings with clear first arrivals of crustal and mantle phases, Pg and Pn waves resp., usually up to the distance of 250 km. The Pg waves are observed at offsets to about 150 km with apparent velocity 5.9 km/s for the Bohemian Massif. At larger offsets, Pn waves can usually be observed with apparent velocity of 8.0 to 8.1 km/s. In some sections, higher attenuation of energy of Pg phase is visible at distances between 90–130 km, which may be connected with a specific upper crustal structure.

For interpretation, the tomographic inversion routine of Hole (1992) was used as an efficient tool to determine the seismic P-wave velocity distribution in the crust using first arrivals. The tomographic models were verified by forward ray tracing modelling where apart from first arrivals also further phases were included. This method was based on well established algorithm developed by Červený and Pšenčík (1983) elaborated in further modifications by Zelt (1994).

2-D inversion of first arrivals and reflected phases shows high P-wave velocity gradient zone reaching the depth of 5–7 km followed by small gradient and laterally homogeneous P-wave

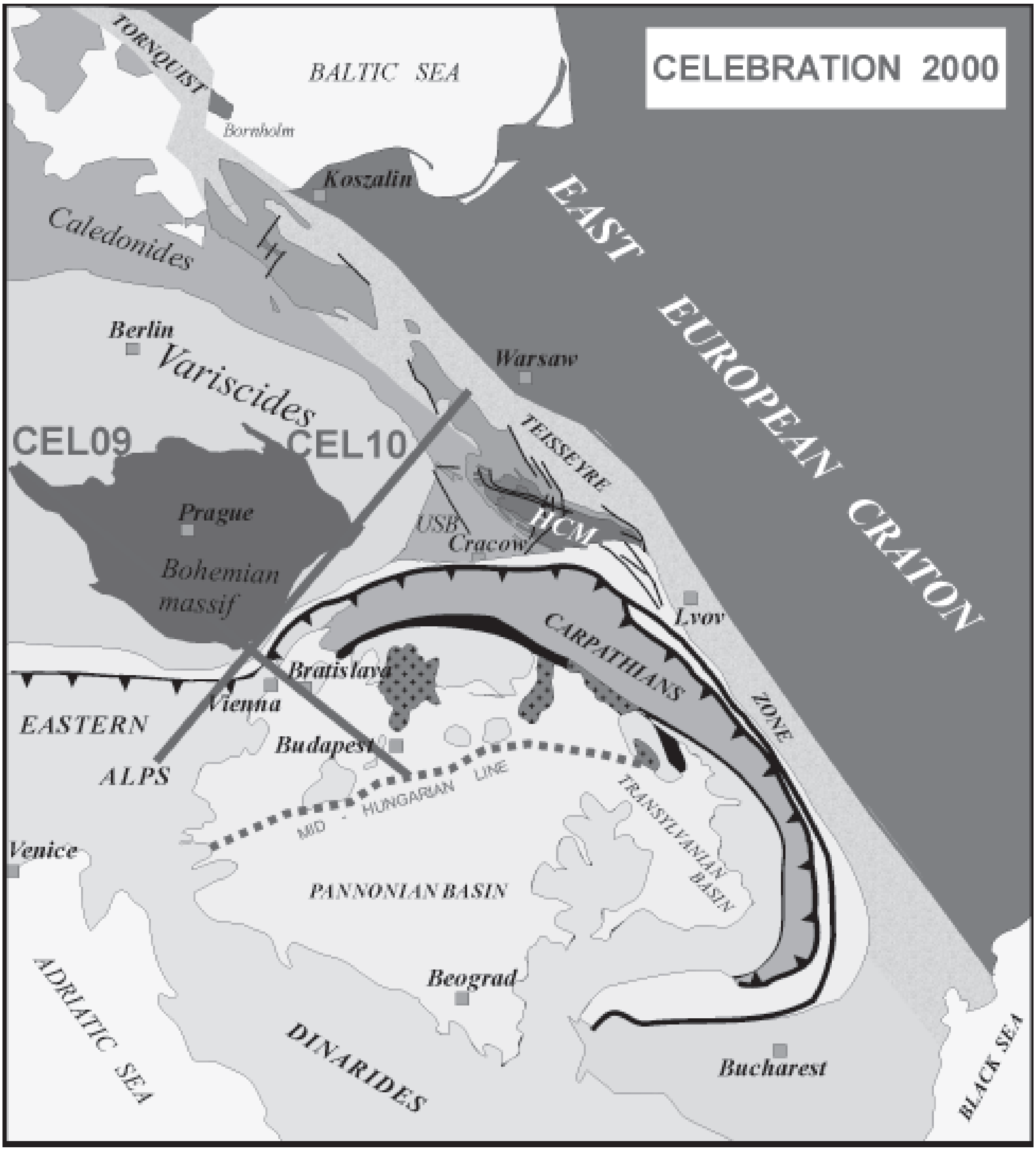

Fig. 1. Tectonic Map of Central Europe, with Celebration profiles CEL 09 and CEL 10.

velocity in the lower crust. Position of Moho discontinuity ranging from 32 km to 39 km and reflectors within the crust complements the P-wave velocity distribution. Differences in the character of velocity distribution delimits contact of the Bohemian Massif with neighbouring tectonic units, namely the Carpathian Foredeep and the Vienna Basin (the beginning of low velocity zone connected with sediments at distance 380 km of profile CEL09) and the Alps (deeper gradient zone related to Moho discontinuity connected with crust thickening ending at distance 150 km of profile CEL10).

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