Parametric Velocity Interpolation in Pannonian Basin

G. Detzky

Eötvös Loránd Geophysical Institute, Hungary (detzky@elgi.hu)

The structural geological interpretation in the reflection seismology is carried out on sections in reflection time (TWT). So that the structural information in TWT could be used together with other information pieces given in depth, it is necessary to have a transformation between TWT versus depth via velocity. In seismic projects the most diverse sources of velocity data are the NMO or DMO stacking velocity sequences, resulted by the velocity analysis of the usual seismic processing flow. Appart from many traditional methods for the interpolation of the 3D seismic velocity space, the proposed one reduces the problem in 3D to 2D. Essential part of so called *parametric interpolation* is the primary 1D approximation of seismic velocity sequences at given locations along vertically ascending discrete TWT values. In the second stage of procedure a simple 2D interpolation of the parameters affecting the actual shape of the functions are used to get an instance of approximation function related to a given location. After checking about 1200 real velocity sequences in the Pannonian Basin, a conclusion has been taken: the following sort of functions could approximate well the real velocity functions in the basin:

$V = V_x + a \frac{bt - \tau}{\sqrt{(bt - \tau)^2 + 1}}$ The parameters of the chosen function are named with expressive meaning: V_x - the velocity at the inflection point as *inflection velocity*, a- the difference between the asymptotic and the inflection velocity as *velocity range*, $b-$the differential coefficient in the inflection point as *inflection gradient, $\tau/b-$*the time value of the function at inflection point as *inflection time*. Analisys aimed at the interdependecies of the approximation parameters of the real test territory has revealed an unexpected regression dependency of the parameters. Secondary parametres derived from these dependences supposed to be treated as parametes of overall characteristics of the studied part of the basin or generaly of the sedimentary basins. Finding the real origin of this parameter dependency phenomenon could be one of the objectives of future research in the topic.