地震勘探原理 双语教学材料

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Exercise 18

Calculate the following convolution $x_k = g_k * f_k$
With g=0,1,0,3,4,5
and f=1,4,4,2

Exercise 19

Calculate the autocorrelation ϕ_{xx} for the following function:

X_k=1,0,2,0,1,2,1,0,0,1,2,1

With a shift from -5 till +5

(without normalisation)

Exercise 20

A X^2-T^2 survey gives the following stacking velocity results:

Layer i	Two-way traveltime from the surface to the base of the layer t_i(s)	Stacking velocity: V_s(km/s)
1	1.100	2.18
2	1.786	2.80
3	1.935	3.20
4	2.250	3.64

Calculate the interval velocities.

Exercise 21

The figure shows a single shot (marine Seismics) with several reflections.

Hydrophone distance 25 m, number of hydrophones 180

Offset for first trace 252m, offset for last trace 4727 m

(a) Identify the numbered reflections in this dataset (primaries or multiples) and show their travelpath

(b) Calculate the velocity of the direct wave

(c) Carry out a velocity analysis with the t^2-x^2 method for the primary reflections

(d) Construct a velocity model with interval velocities using Dix's formula