## Layered refraction tomography with 7 shots into 20 receivers :

Our latest Rayfract® version 3.32 allows ***automatic WET inversion with layered starting model*** . The layered starting model is regenerated and *WET inversion* is started whenever you run ***time-to-depth conversion in Depth menu*** with Plus-Minus, Wavefront or CMP intercept-time refraction methods.

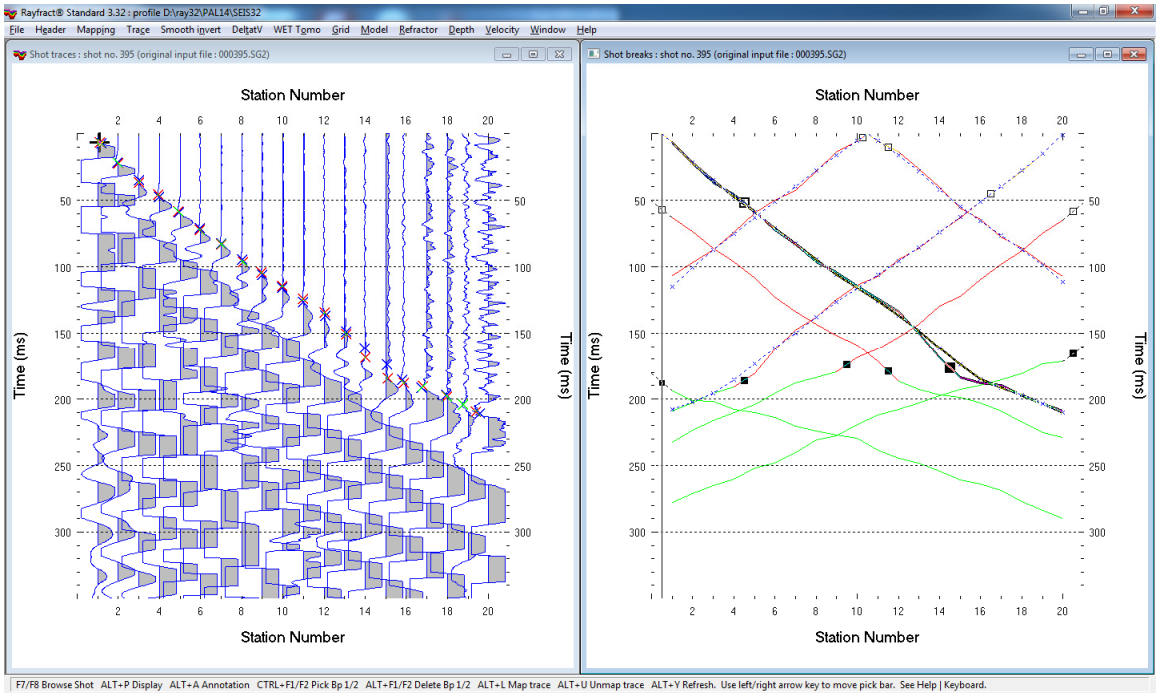

Fig. 1 : left : *Trace*|*Shot gather*, right : *Refractor*|*Shot breaks*.

- *File*|*New Profile…*, set *File name* to PAL14 and click *Save button*
- set *Station spacing* to 10m in *Header*|*Profile…*
- download PAL14.ZIP and unzip in `C:\RAY32\PAL14\INPUT`
- select *File*|*Import Data…* and set *Import data type* to SEG-2
- set *Default shot hole depth* to 0.45m. Leave *Default spread type* at *10: 360 channels*.
- click upper *Select button*, navigate into `C:\RAY32\PAL14\INPUT` and select one .SG2 file
- click *Open button* and *Import shots button* . Now the *Import shot dialog* is shown for each .SG2 file.
- for each shot leave *Layout start* at 1, edit *Shot pos.* to value shown below and click *Read button*

| Shot no. | Layout start [Station no.] | Shot pos. [Station no.] | Free trial shot no. |
|---|---|---|---|
| 393 | 1 | -14 | 3 |
| 394 | 1 | -5 | 4 |
| 395 | 1 | 0.5 | 5 |
| 398 | 1 | 10.5 | 8 |
| 399 | 1 | 20 | 9 |
| 400 | 1 | 25 | 10 |
| 401 | 1 | 35 | 11 |

- *File*|*Update header data…*|*Update First Breaks…* with `C:\RAY32\PAL14\INPUT\BREAKS.LST` or `TRIAL.LST` when using our free trial.
- select *Trace*|*Shot gather* and *Window*|*Tile* to obtain Fig. 1 .
- for both windows click title bar, press ALT+P, set *Maximum time* to 350 ms and hit ENTER key.
- select *Header*|*Station*, set z coordinate of first station to 0.0 and hit ENTER

- map traces to refractors in *Refractors|Shot breaks* (Fig. 1) as described in our .pdf reference chapter **Mapping traces to refractors**. Use ALT+L keyboard shortcut to remap all traces.
- uncheck *WET Tomo|WET tomography Settings|Blank below envelope after last iteration*
- select *Depth|Wavefront* to obtain Fig. 2. Click *Yes button* to obtain *WET inversion* output (Fig. 3).

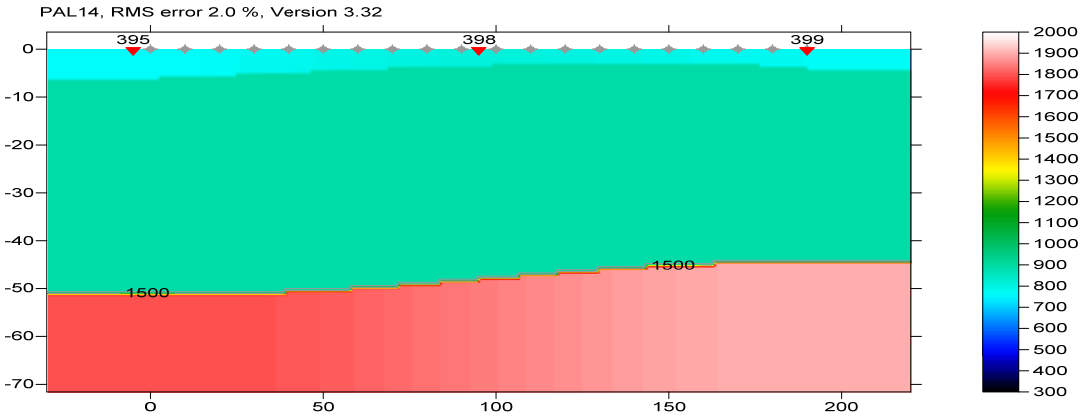


Fig. 2 : layered starting model obtained with *Depth|Wavefront…* after mapping traces to refractors (Fig. 1)

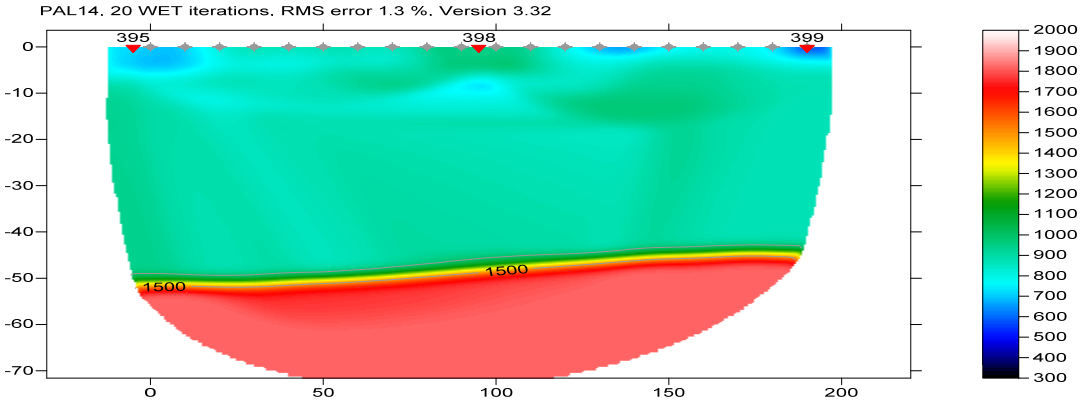


Fig. 3 : WET with starting model Fig. 2, 20 WET iterations, default settings, no blanking below envelope after last iteration

- click on *Surfer icon* in *Windows task bar* and click tab COVERG20.SRF to obtain Fig. 4
- note large central area without coverage in Fig. 4. We recommend to record 5 or more shots positioned inside each refraction spread, not only 3 as in Fig. 1. *WET inversion* cannot use shots offset from first/last receiver more than one *station spacing* except if you use overlapping receiver spreads. See our rayfract.pdf reference chapter **Overlapping receiver spreads**.
- offset shots are always used for the starting model GRADIENT.GRD, PLUSMODL.GRD, WAVEMODL.GRD or CMPMODL.GRD .

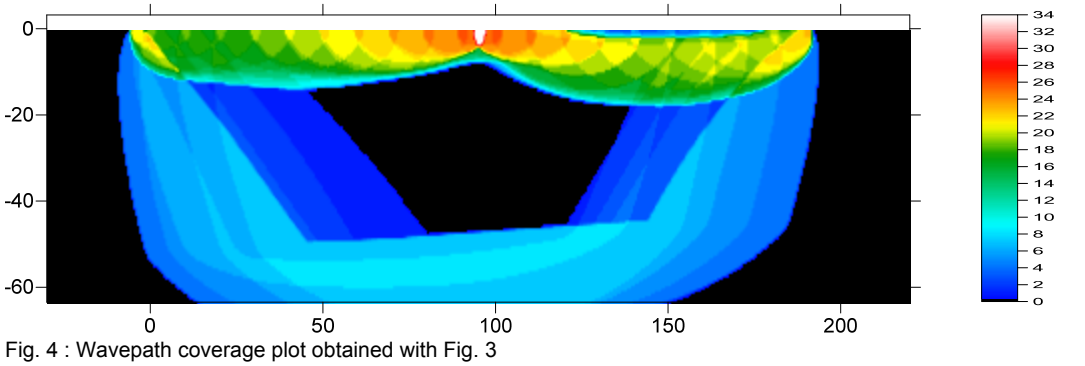


Fig. 4 : Wavepath coverage plot obtained with Fig. 3