

Origin and significance of intra- basement seismic reflections offshore western Norway

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Supplementary material S1

This supplementary material contains an explanation of the velocity model used to depth convert interpretations made from time-migrated seismic reflection data.

Time-depth data from wells 35/9-2 and 36/7-1 (See Fig. 1B) are shown in Fig. S1. Both wells show almost identical relationships between TWT and depth to depths of ~ 2.5 km. A best fit second-order polynomial trend line has been fit to these data and this relationship has been used to depth convert horizon interpretations down to the acoustic basement.

$$d = 275.92t^2 + 481.77t + 76.833 \quad R^2 = 0.9991 \quad d = \text{depth, } t = \text{TWT}$$

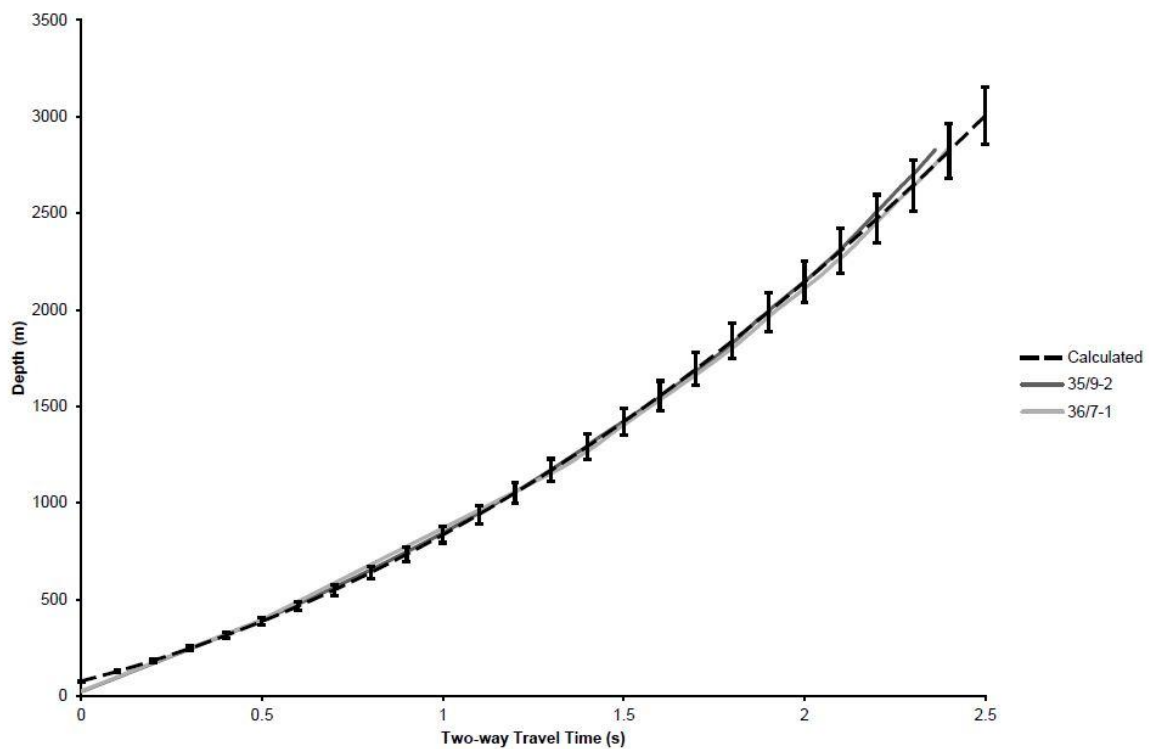


Fig. S1 Time-depth data for wells 35/9-2 and 36/7-1. See Fig. 1B for location

In order to depth convert intrabasement reflections interpretations, firstly the depth to the basement was depth converted using the polynomial time-depth relationship described above. Secondly a constant P-wave seismic velocity of 6 km/s was assigned to the basement following studies by Goff & Holliger, 1999. The interpreted TWT between the intrabasement reflections and basement was then depth converted using a constant velocity of 6km/s, and this depth was added to the basement depth to get the total depth to the intrabasement reflection. Basement rock velocities of 5.5 km/s and 6.5 km/s were also considered. The variations in depth to intrabasement reflections and the dip angles of these surfaces caused by these variations in velocity were found to be less than 5%.