

A low-angle detachment fault revealed

Schuba, CN; Gray, GG; Morgan, JK; Sawyer, DS; Shillington, DJ; Reston, Timothy; Bull, JM; Jordan, BE

DOI:

DOI: [10.1016/j.eps1.2018.04.012](https://doi.org/10.1016/j.eps1.2018.04.012)

License:

Creative Commons: Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)

Document Version

Peer reviewed version

Citation for published version (Harvard):

Schuba, CN, Gray, GG, Morgan, JK, Sawyer, DS, Shillington, DJ, Reston, T, Bull, JM & Jordan, BE 2018, 'A low-angle detachment fault revealed: three-dimensional images of the S-reflector fault zone along the Galicia passive margin', *Earth and Planetary Science Letters*, vol. 492, pp. 232-38. [https://doi.org/DOI: 10.1016/j.eps1.2018.04.012](https://doi.org/10.1016/j.eps1.2018.04.012)

[Link to publication on Research at Birmingham portal](#)

Publisher Rights Statement:

Checked for eligibility: 18/06/2018

General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact UBIRA@lists.bham.ac.uk providing details and we will remove access to the work immediately and investigate.

Supplementary Information for: A low-angle detachment fault revealed: Three-dimensional images of the S-reflector fault zone along the Galicia passive margin

SI.1. Seismic data acquisition

The Galicia 3-D seismic reflection volume was acquired during the summer of 2013 onboard the *R/V Marcus G. Langseth*. This vessel is owned by the U.S. National Science Foundation and it is operated by the Lamont Doherty Earth Observatory of Columbia University.

The *Langseth* was configured to have four 6-km streamers spaced 200 m apart. The streamers were towed at the depth range of 12-15 m. Each streamer included 468 hydrophones for a total of 1782 channels. The sources were made up of two arrays of 18 airguns. The airguns had a capacity of 3300 cu in. These arrays were 100 m apart and towed at a depth of 9 m. These airgun arrays were fired in alternating order. This was repeated every 37.5 m. This configuration resulted in 8 common midpoints in line form, with 50 m spacing. The resulting seismic volume has an area of 68.75 km by 20 km, comprised of 801 inlines and 2751 crosslines.

SI.2. Seismic data processing

Repsol S. A. processed the 3-D volume to time migration. Their workflow comprised of: 12.5 m by 12.5 binning, gain recovery $(t/250)^{1.5}$, low-cut filter, swell noise filter, zero-phase de-signature, linear noise attenuation, surface-consistent amplitude correction, 3-D surface-related multiple elimination (SRME), radon demultiple, diffracted multiple attenuation, time destripping, 3-D regularization, pre-stack time migration (PSTM), residual moveout correction, and time-variable filtering. Chevron Exploration Technology Company applied noise reduction on the time-migrated volume. Interpretations were carried out on this pre-stack time migrated and denoised dataset using PetrelTM.

SUPPLEMENTARY FIGURE CAPTIONS

Figure S1. Enlargements of boxes A-D from Fig. 3b that show corrugations. Brighter colors are deeper. Dashed and dotted black lines have been added to highlight corrugation orientations.

Corrugations maintain their continuity across fault intersections in boxes A, B and D.

Corrugation azimuths for (a), (b), (c), and (d) are $\sim 115^\circ$, $\sim 100^\circ$, $\sim 130^\circ$, and $\sim 110^\circ$, respectively.

Figure S2. Representative seismic reflection profiles of the S-interval layer in areas of overlying fault intersection. Dotted white and black lines represent S and S' surfaces. Dashed yellow line represents overlying crustal fault. (a) displays a case where S-interval is thicker in the footwall of the overlying fault whereas (b) shows thicker S-interval accumulation beneath the hanging wall.



