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Incorporating scientific research into undergraduate courses: A hands-on approach

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Introducing undergraduates to the frontiers in geoscientific research is often achieved by providing students with extensive reading lists of topical publications. This passive form of learning, whilst imparting details of the latest scientific results and controversies, does not necessarily develop the student's ability to think critically or analyse data. We therefore devised a practical exercise to accompany the standard lectures and reading lists for a course about the Earth's deep structure and composition. In this exercise, students used computer modelling to interpret seismic data for the Earth's mantle in terms of temperature and composition. The exercise simulated the methodology of a recent publication, but programming requirements were kept minimal, as the focus was on improving students' analytical skills and awareness of data uncertainties. Feedback from the students was very positive: the exercise helped them to understand better how the theory presented in the lectures is applied in active scientific research.