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# A database of gabbro seismic properties from an ultraslow spreading ridge (IODP Hole U1473A, Southwest Indian Ridge)

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Gabbros are the main component of the oceanic crust and represent ~2/3 of the total magmatic crustal thickness. At the interface between magmatic, tectonic and hydrothermal processes, gabbros from slow spreading ridges may have a complex mineralogy and microstructural evolution. This includes structures that vary from purely magmatic fabrics, with layering and magmatic alignment of minerals, to rocks deformed from subsolidus temperatures to the lower-T brittle-ductile conditions. Such a variation is normally accompanied with changes in mineralogy, microstructures and crystallographic preferred orientations (CPO) of the main phases of these rocks, which in turn a!ect their seismic properties. Here we present a database of the CPO-derived seismic properties of 70 samples collected during the IODP Expedition 360 (site U1473). The dominant phases are plagioclase and clinopyronexe, with variable contents of olivine, enstatite, magnetite, ilmenite, chlorite and amphibole. Velocities of compressional and shear waves decrease drastically with increasing of plagioclase content, increase strongly with increasing of ilmenite content, but increase only slightly with clinopyroxene, while variations in olivine and enstatite content seem to be less important. Maximum velocities can be either parallel to the strongest concentration of (010) poles of plagioclase or olivine/clinopyroxene [001], depending on the proportions between these phases. Anisotropy of P waves vary from ~2% in the more isotropic gabbros with weak magmatic fabric to a maximum of ~9% in more mylonitic terms. A similar effect is observed for the S-waves. Destructive interference between plagioclase CPO vs. clinopyroxene/olivine reducing anisotropy observed in some samples. This is because the maximum Vp in a foliated gabbro is parallel to the maximum concentration of poles to (010), and perpendicular to olivine and clinopyroxene. As the lineation in our gabbros is generally marked by olivine and clinopyroxene [001] (instead of the fast direction [100]), this possibly cause anisotropy reduction. When present in the more mylonitized gabbros, amphibole has strong CPOs and help to increase the general anisotropy of P and S waves, but the increase is not drastic. An increase of Vp and Vs anisotropy is also observed with stronger plagioclase CPOs, which is not observed in the case of clinopyroxene. The elastic constants calculated from these aggregates will be used as input for more physically robust calculations using differential effective medium approaches to better understand the e!ect of melt inclusions in these rocks by the time of their deformation in the lower crust.