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Regularity of oblique transmission problems

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Transmission problems model phenomena in domains composed of several adjacent phases. While a variational “divergence-form” theory is by now classical, a non-variational framework has only emerged more recently. This talk concerns the regularity of viscosity solutions to such transmission problems in non-divergence form.

I will present new regularity results in the case of flat interfaces, where the transmission condition may depend on both the normal and tangential derivatives of the solution. This condition can be viewed as a nonlinear coupling of oblique derivatives across the interface. Our main result establishes optimal piecewise $C^{1,\alpha}$ regularity for viscosity solutions.