Formation of a solar wind stream interaction region observed at two radial distances from the Sun

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The solar wind, arising from the expansion of the solar corona into the interplanetary medium, is a super-sonic and super-Alfvénic outflow of plasma with speeds ranging from 150-800 km/s. Due to the Sun's rotation, a slower stream can gradually be caught up, compressed, and deflected by a faster solar wind stream coming from another source region. This phenomenon happens on a heliospheric scale, creating so-called "Stream Interaction Regions" (SIRs). In a SIR, a pair of fast magnetosonic shocks can emerge at the interface between the two streams. Configurations where the Parker Solar Probe (PSP) and Solar Orbiter (SolO) spacecraft are radially aligned allow, through in-situ measurements, studies of the solar wind evolution at two different radial distances from the Sun. We take advantage of such a configuration, occurring at the end of April 2021, to show the emergence of a SIR from PSP (~0.1 au) to SolO (~0.9 au). Moreover, at Solar Orbiter, the observed interface between the unperturbed and compressed slow wind (fast wave/shock) is shown to be more complex than a thin discontinuity and exhibits potential signatures of magnetic reconnection.