To operate future fusion devices under safe conditions it is crucial to limit the heat fluxes onto the divertor targets. Heat flux profiles have been extensively studied in ASDEX Upgrade and other divertor tokamaks by infrared (IR) measurements, which resulted in commonly accepted scalings for the power decay length [1]. However, while IR measurements provide the most accurate way to measure the total heat flux, it is not possible to measure the electron and ion contributions to the total target heat flux.

In this contribution it is shown how Langmuir Probe (LP) measurements can be used together with the IR data to disentangle ion and electron heat fluxes [2]. Langmuir probes measure the electron temperature and the ion saturation and electric currents. From these measurements the electron target heat flux is obtained by using conventional sheath theory. The ion temperature, however, is not measured, and therefore the ion heat flux can not be calculated without further assumptions. Nevertheless, an estimate for the ion heat flux is achieved from a comparison with the IR data. Hence, this analysis offers a distinction between ion and electron heat flux channels [3] in order to investigate their roles in the SOL transport.

The analysis shows that for low density L-mode discharges the outer target heat flux is dominated by the electron heat flux. These discharges exhibit peaked electric current profiles, while the ion current profiles are broad. The combination of these two fluxes leads to a double decay length feature in low density discharges, which is also observed in the IR data. Furthermore, by applying a 1D heat flux transport model it is demonstrated that the electric current can carry a large fraction of the electron heat flux along the SOL convectively. Therefore, a Spitzer-Härm approach, where it is assumed that heat is transported only conductively, might not be valid in the investigated discharges. Moreover, although for NBI and ECRH heated L-modes the core ion and electron temperature profiles vary strongly, the divertor profiles agree within the measurement uncertainties. Hence, no effect of the heating method onto the SOL transport is observed.