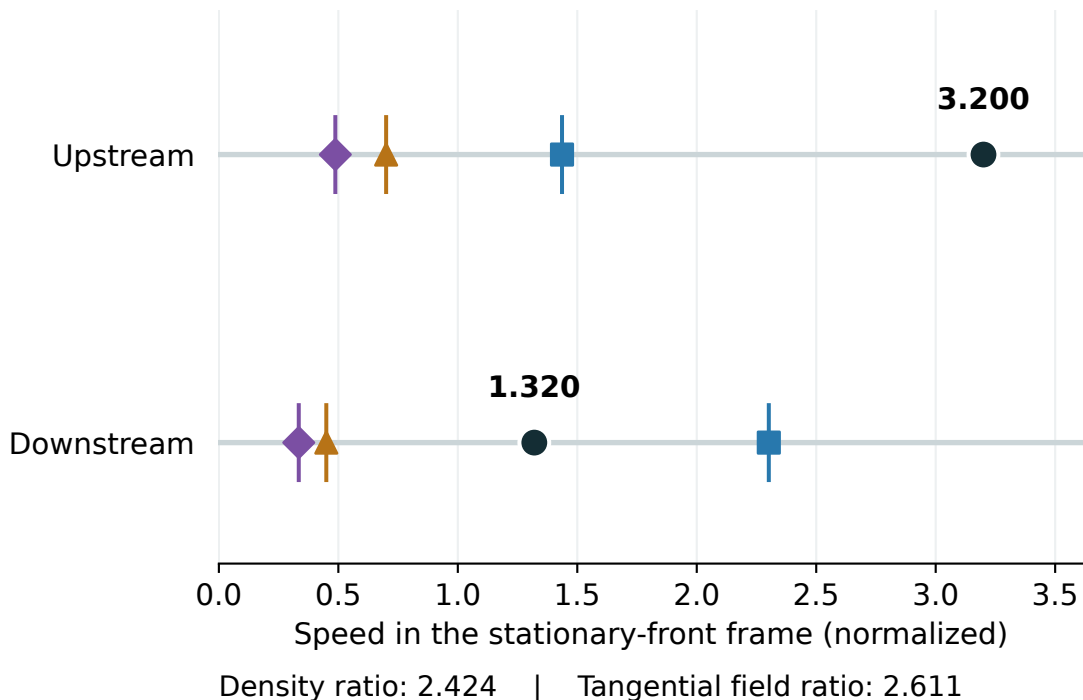


Two state pairs, two checked shock families

Family labels were absent from the diagnostic inputs. Both pairs pass conservation and entropy checks.

● Plasma speed $|u_n - S|$ ◆ Slow speed c_s ▲ Normal Alfvén speed $c_{A,n}$ ■ Fast speed c_f

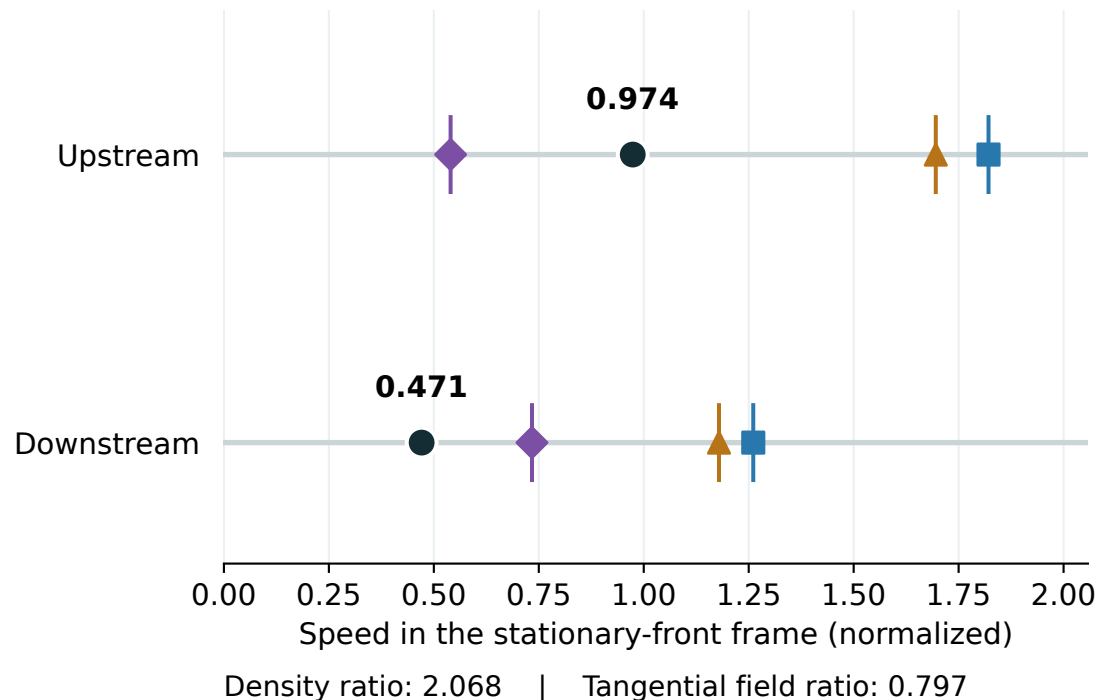
A63: Fast shock (1 → 2)



The flow crosses the fast speed.

Controls: A42 gives a contact; A88 gives a rotational discontinuity. Neither is assigned a shock family.

A17: Slow shock (3 → 4)



The flow crosses the slow speed.

Synthetic exact-state checks in ideal MHD. No observational error propagation, full-fan completeness or solar classification.