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Mass-loss of M-type stars - impact on planetary atmospheres

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Stars lose fractions of their mass via steady winds and discrete ejections. Stellar mass-loss is thought to have important consequences for the atmospheres of nearby planets. If exposed to dense particle streams during long timescales, planets might even lose their whole atmospheres, especially if their magnetic field protection is weak due to tidal locking. For our Sun, these mass outflows can be probed directly, and a variety of methods exists to study dense stellar winds. However, mass-loss rates of stars in the order of the solar value are too tenuous to produce any detectable emission. Several attempts have been made to estimate the mass-loss rates of late-type stars, but the results show large scatter and depend strongly on the model assumptions needed for the particular technique used. Since it is assumed that active M˜dwarfs which exhibit powerful flares and XUV emission should also have enhanced mass-loss rates, observational evidence for this assumption is needed to optimize theoretical models addressing the habitability of planets around M dwarfs.