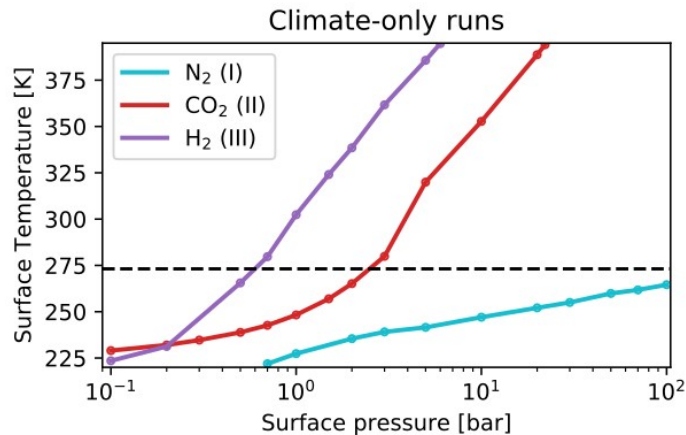


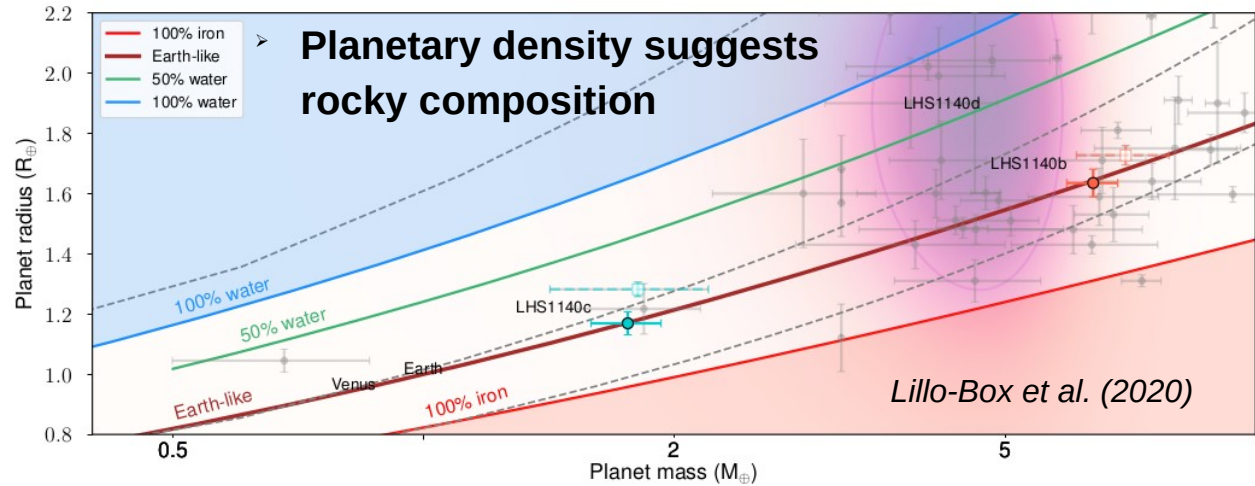
Detectability of biosignatures on LHS 1140 b

Fabian Wunderlich, M. Scheucher, J. L. Grenfell, F. Schreier, C. Sousa-Silva, M. Godolt, and H. Rauer

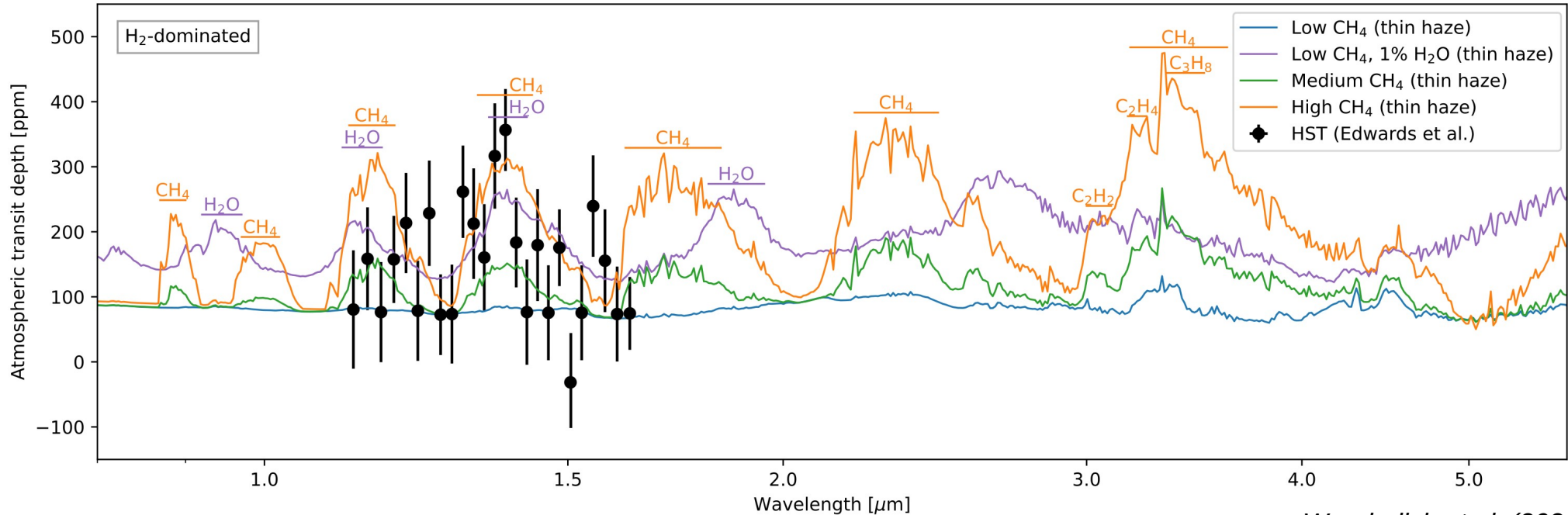
LHS 1140 b – super-Earth in the habitable zone around mid M dwarf



Wunderlich et al. (2021)



Transmission spectra of H₂-dominated atmospheres compared to HST observations



Wunderlich et al. (2021)

- Observations suggest CH₄ or H₂O absorption at $\sim 1.4 \mu\text{m}$

Number of transits required to detect species with JWST or ELT

Detectability of major features with the JWST

# Tr. H ₂ atm.	CO ₂	CH ₄	H ₂ O	H ₂
Low CH ₄	550	22	5	2
Medium CH ₄	110	1	5	5
High CH ₄	60	1	1	5

Detectability of potential biosignatures in H₂-dominated atmospheres

# Tr. JWST / ELT	NH ₃	PH ₃	CH ₃ Cl	N ₂ O
Low CH ₄	37 / 2	9 / 25	8 / 15	18 / 10
Medium CH ₄	45 / 5	17 / 27	164 / 36	11 / 10
High CH ₄	1009 / 9	30 / 17	68 / 47	11 / 10

Wunderlich et al. (2021)