

# Metal-Rich M-dwarf Planet Hosts: [Fe/H] with K-band Spectra



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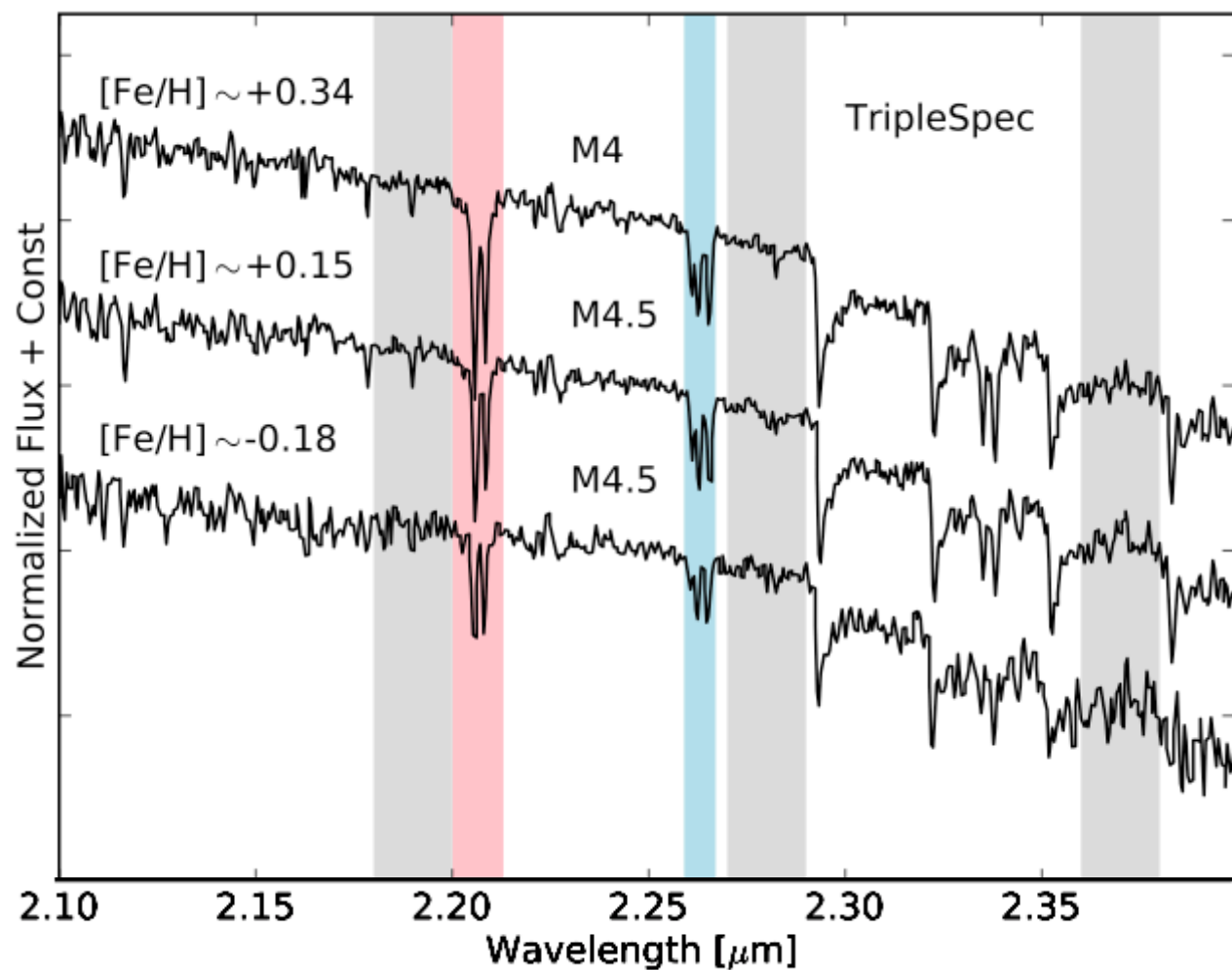


Fig. 1.- (a) K-band spectra of GJ 324 B (top), HIP 57050 (middle), and GJ 783.2 B (bottom). The regions used to calculate the EW of the Na I doublet, the EW of the Ca I triplet, and the H<sub>2</sub>O-K index defined by Covey et al. 2010 are shown in red, blue and grey, respectively.

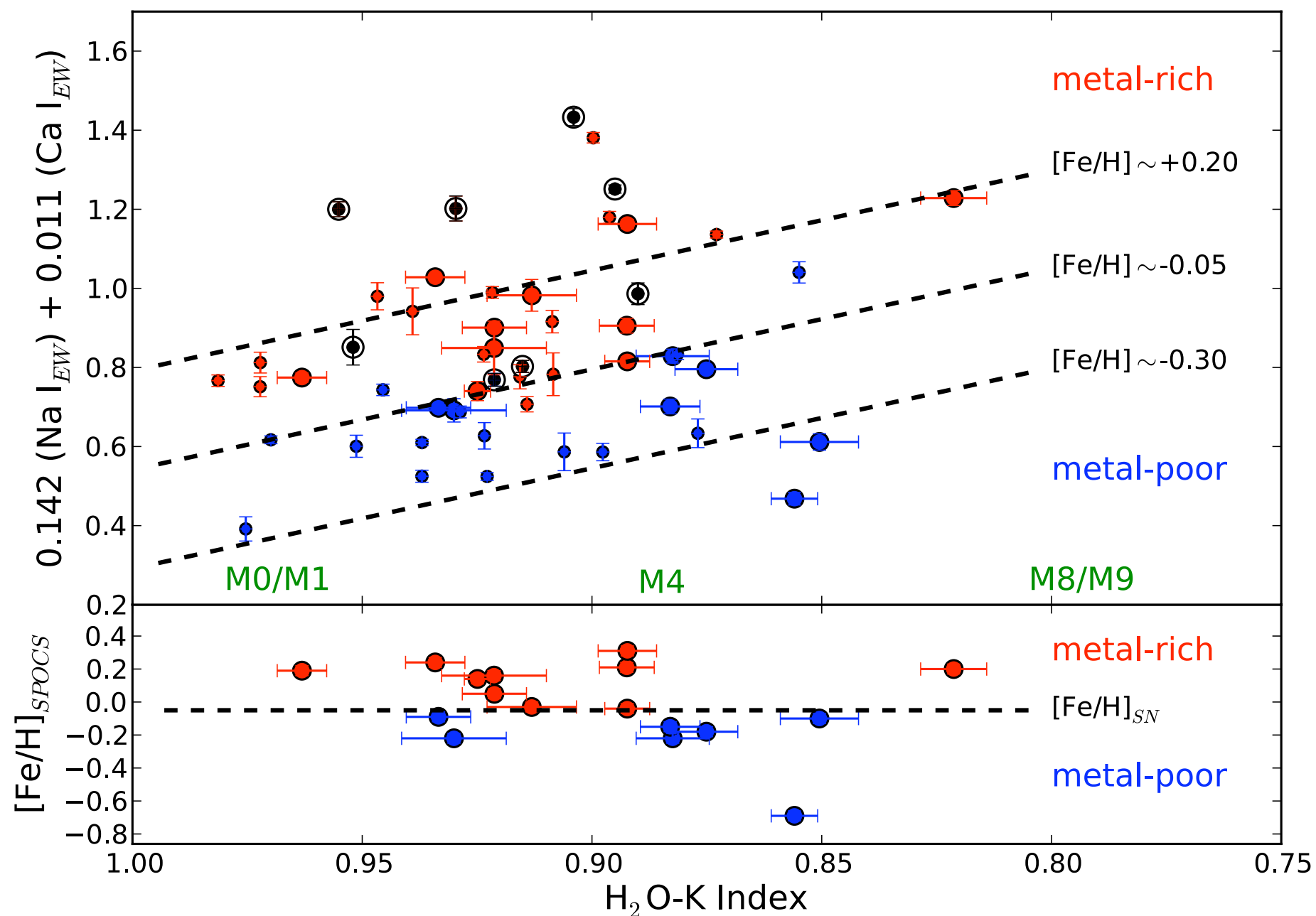


Fig. 2.- A linear combination of the EWs of the Ca I and Na I features versus the K-band Water Index. The big red and blue dots are M-dwarfs with FGK-companions with  $[\text{Fe}/\text{H}]_{\text{SPOCS}} > -0.05$  and  $[\text{Fe}/\text{H}]_{\text{SPOCS}} < -0.05$ , respectively (Valenti & Fischer 2005). The small red and blue dots represent M-dwarfs with  $[\text{Fe}/\text{H}] \geq -0.05$  and  $[\text{Fe}/\text{H}] < -0.05$  respectively, according to the photometric calibration by Johnson & Apps 2009. **The big black dots represent the M-dwarf planet hosts.** The  $[\text{Fe}/\text{H}]$  values for the metallicity calibrators are also plotted versus the H<sub>2</sub>O-K index, to emphasize the index's insensitivity to metallicity. The dashed lines in the top panel are iso-metallicity contours for  $[\text{Fe}/\text{H}]$  values of  $-0.30$ ,  $-0.05$  and  $+0.20$ . **According to our determination, all of the M-dwarf planet hosts analyzed in this work have metallicities higher than  $[\text{Fe}/\text{H}] = -0.05$ , with the Jovian planet hosts being more metal-rich than their Neptune host analogs, which is in agreement with the metallicity distribution of FGK-dwarfs with planets.**

Name	EW [ $\text{\AA}$ ]		Index H2O	This Work	
	Na I	Ca I		Sp. Type	$[\text{Fe}/\text{H}]$
HIP 79431	9.699	5.470	0.904	M3.5	+0.60
GJ 849	8.043	5.635	0.955	M1.5	+0.49
GJ 876	8.126	4.721	0.930	M2.5	+0.43
GJ 1214	8.520	4.095	0.895	M4.0	+0.39
GJ 649	5.651	4.722	0.952	M1.5	+0.14
HIP 57050	6.628	4.410	0.890	M4.5	+0.12
GJ 436	5.328	4.456	0.915	M3.0	-0.00
GJ 581	5.108	4.202	0.921	M3.0	-0.02