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A SEARCH FOR EXOSPHERIC COMPONENTS OF THE EXTRASOLAR PLANET HD209458b WITH SUBARU HDS

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We have searched for excess absorption due to the exospheric atomic components of the transiting extrasolar planet HD 209458b in optical region (4100-6800 Å), using Subaru High Dispersion Spectrograph (HDS). Such absorption features would be produced by the transmission of a fraction of the starlight through the exosphere of the planet during its transits. While we do not detect any transit related absorption, but are able to put the most stringent upper limits on the lines we examined, including Na D, Li, Hα, Hβ, Hγ, Fe, and Ca. Sufficient sensitivity was achieved to exclude, at the 3σ level, ~1% additional absorption in a 0.3 angstrom band (the core of the lines) and few tenths of a percent in a 2 angstrom one (the full line width) for all of these lines. These results are the most sensitive such measurements yet achieved from ground based observations.