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Supplement of

Classification and properties of non-idealized coastal wind profiles – an observational study

Christoffer Hallgren et al.

Correspondence to: Christoffer Hallgren (christoffer.hallgren@geo.uu.se)

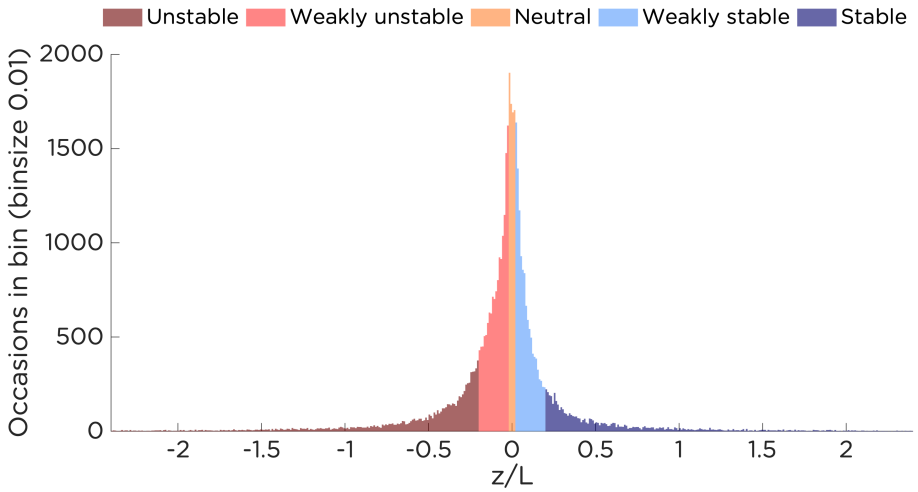

Figure S1: Histogram of the stability parameter, z/L, divided into the five different stability classes. Bin size: 0.01.

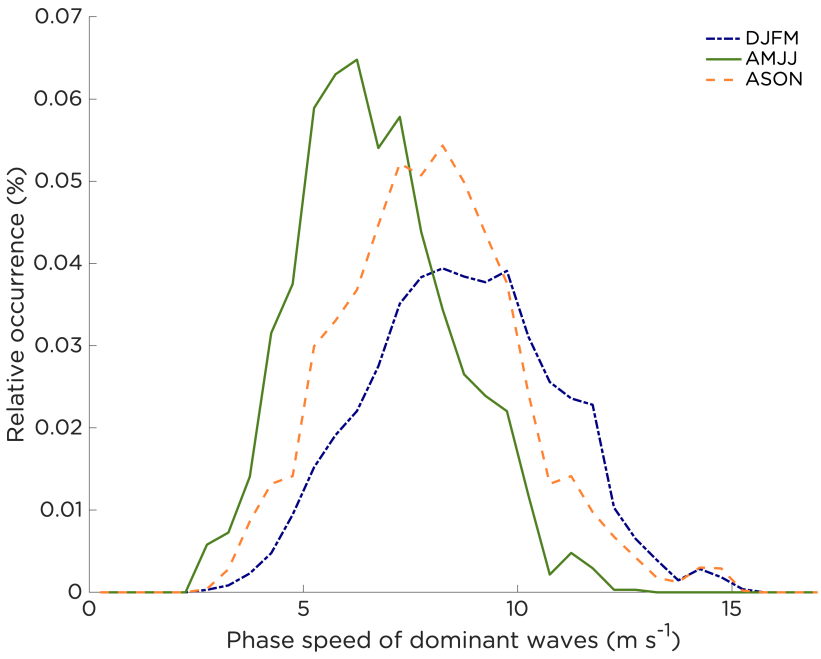

Figure S2: Normalized distributions of phase speed of the dominant waves in the three seasons DJFM, AMJJ and ASON when the wind is from the open sea sector. Bin size: 0.5 m s^{-1}.

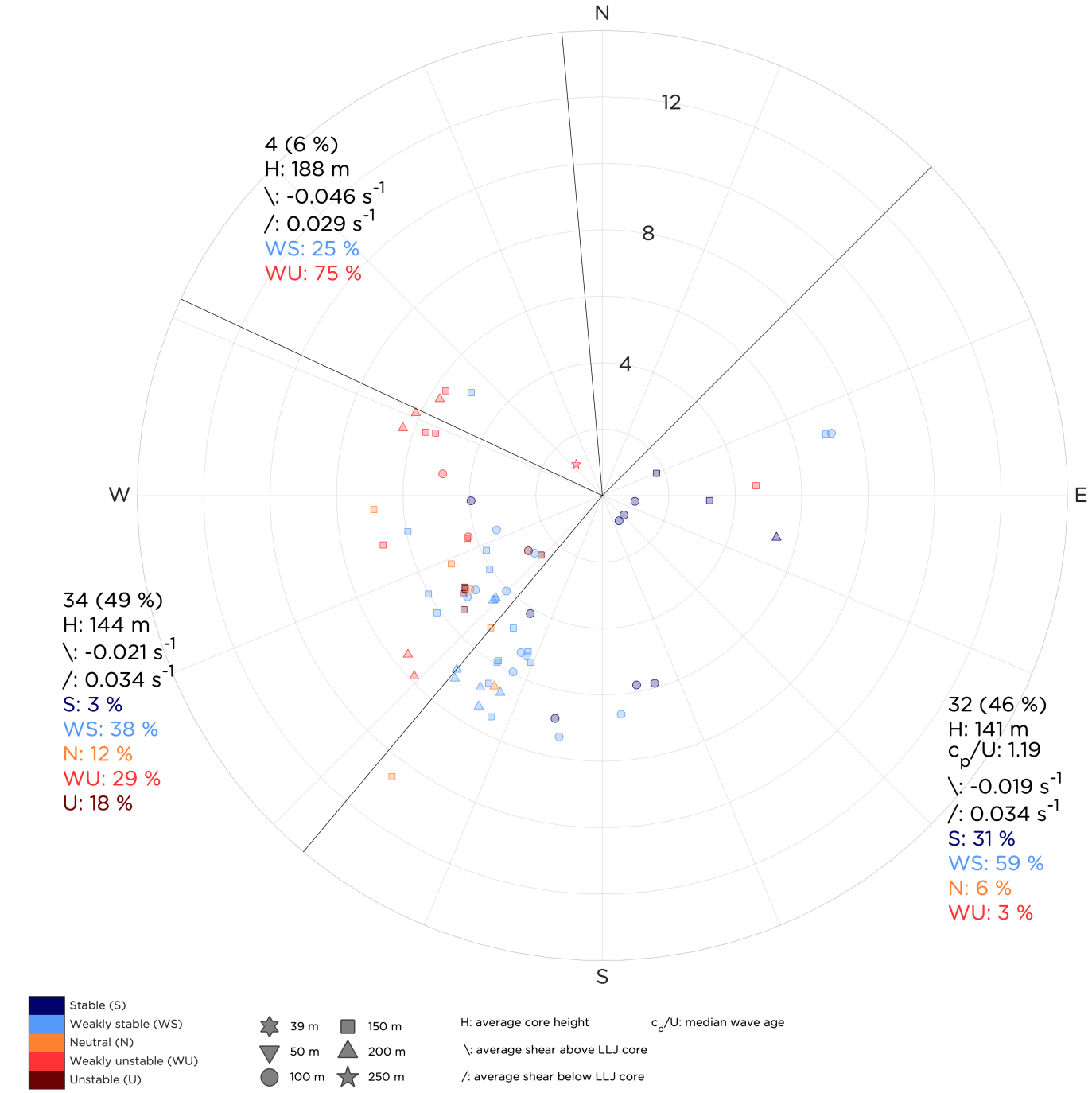

Figure S3: Overview of the seasonal occurrence of all profiles classified as strong LLJs in the season DJFM. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the LLJ core. Statistics regarding the profiles are presented for three sectors.

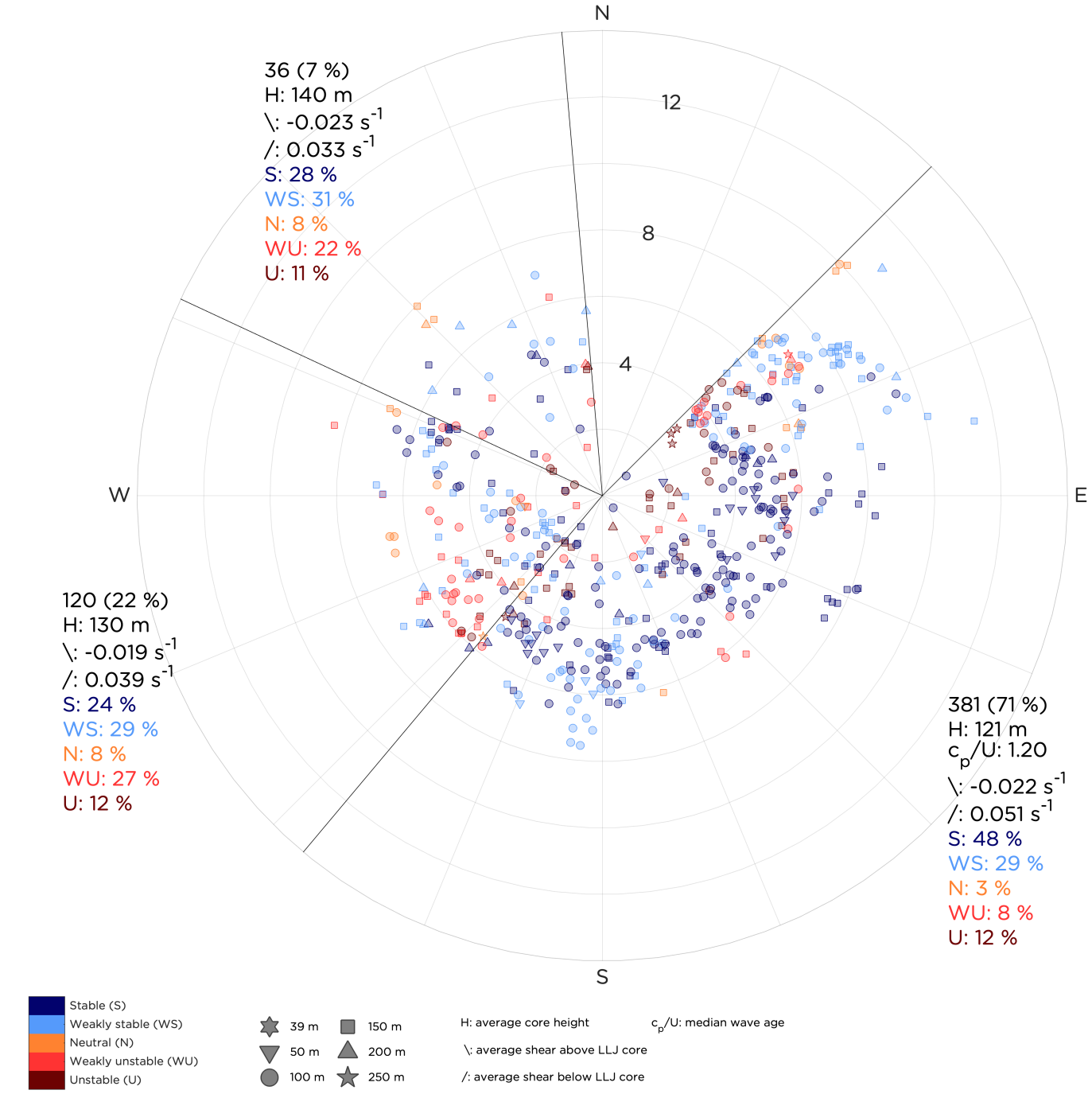

Figure S4: Overview of the seasonal occurrence of all profiles classified as strong LLJs in the season AMJJ. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the LLJ core. Statistics regarding the profiles are presented for three sectors.

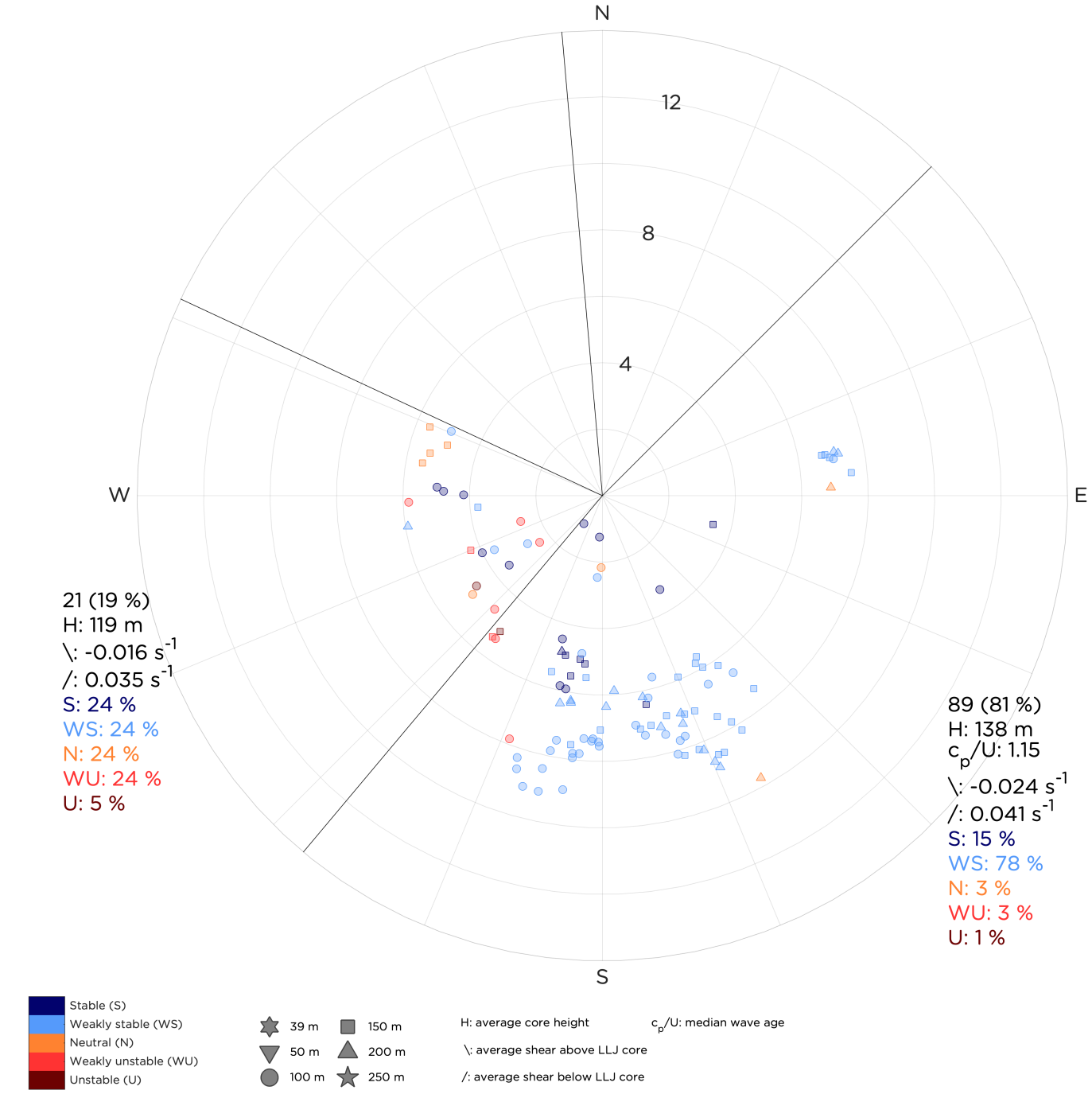

Figure S5: Overview of the seasonal occurrence of all profiles classified as strong LLJs in the season ASON. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the LLJ core. Statistics regarding the profiles are presented for three sectors.

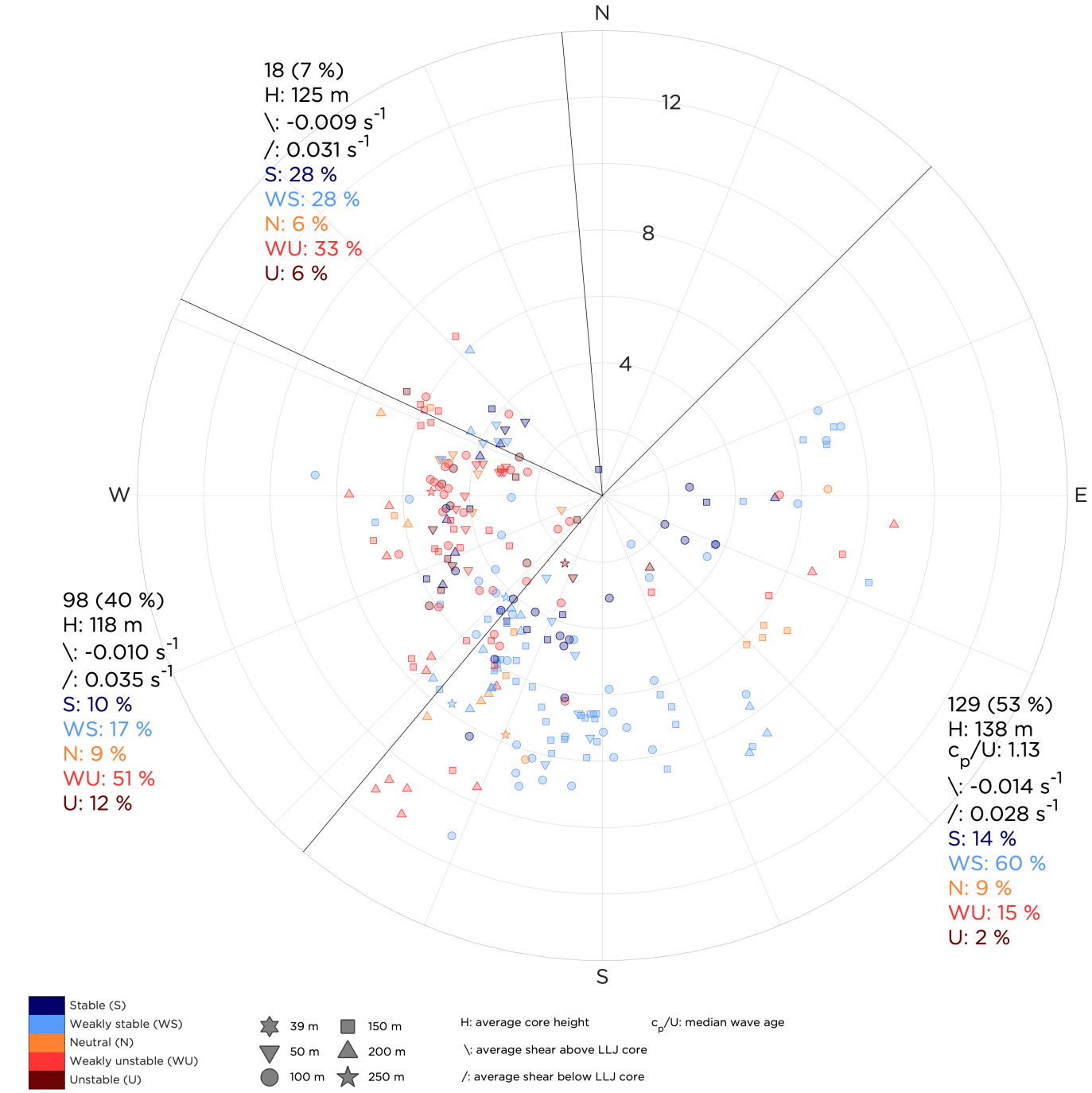

Figure S6: Overview of the seasonal occurrence of all profiles classified as weak LLJs in the season DJFM. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the LLJ core. Statistics regarding the profiles are presented for three sectors.

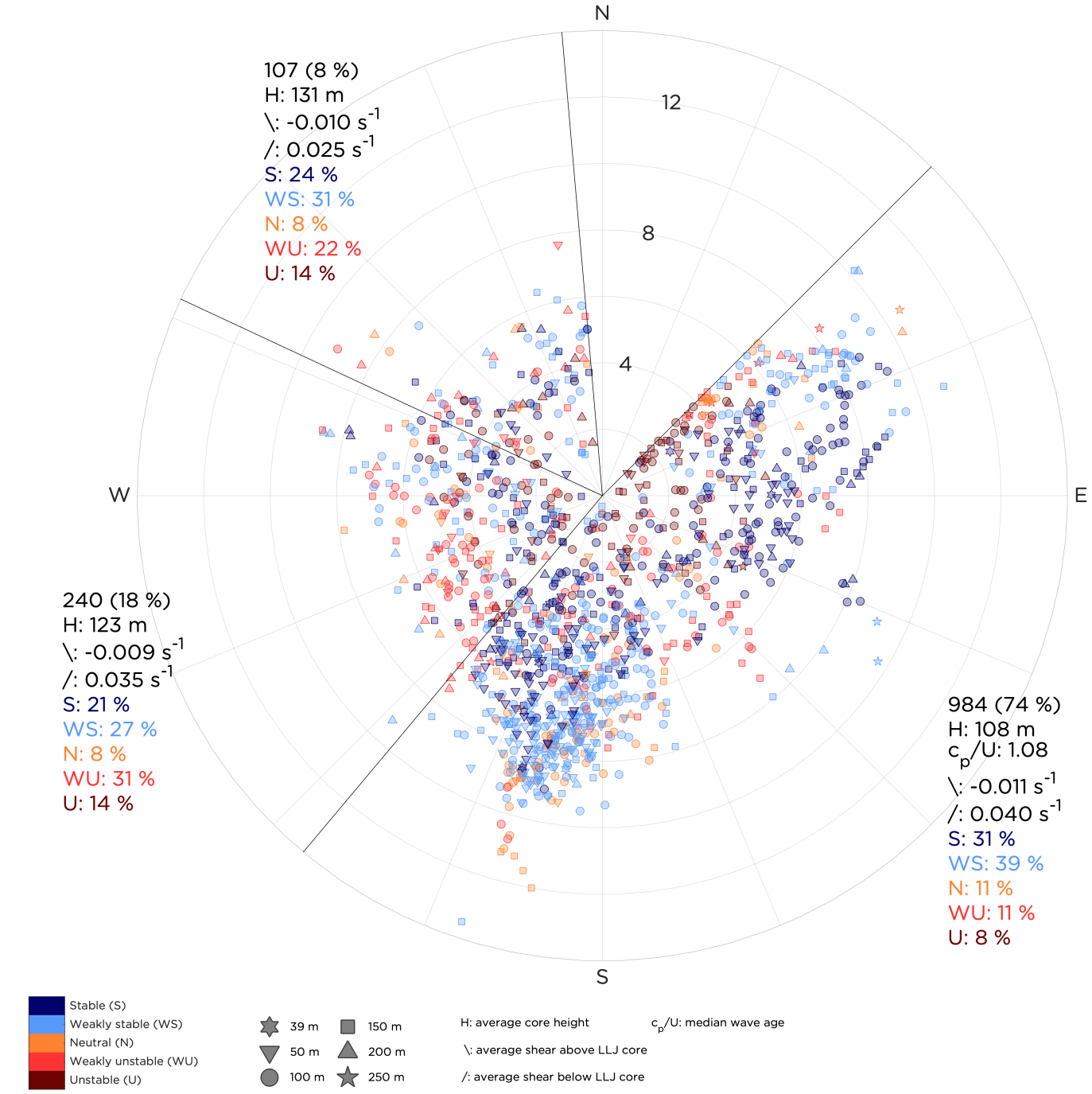

Figure S7: Overview of the seasonal occurrence of all profiles classified as weak LLJs in the season AMJJ. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the LLJ core. Statistics regarding the profiles are presented for three sectors.

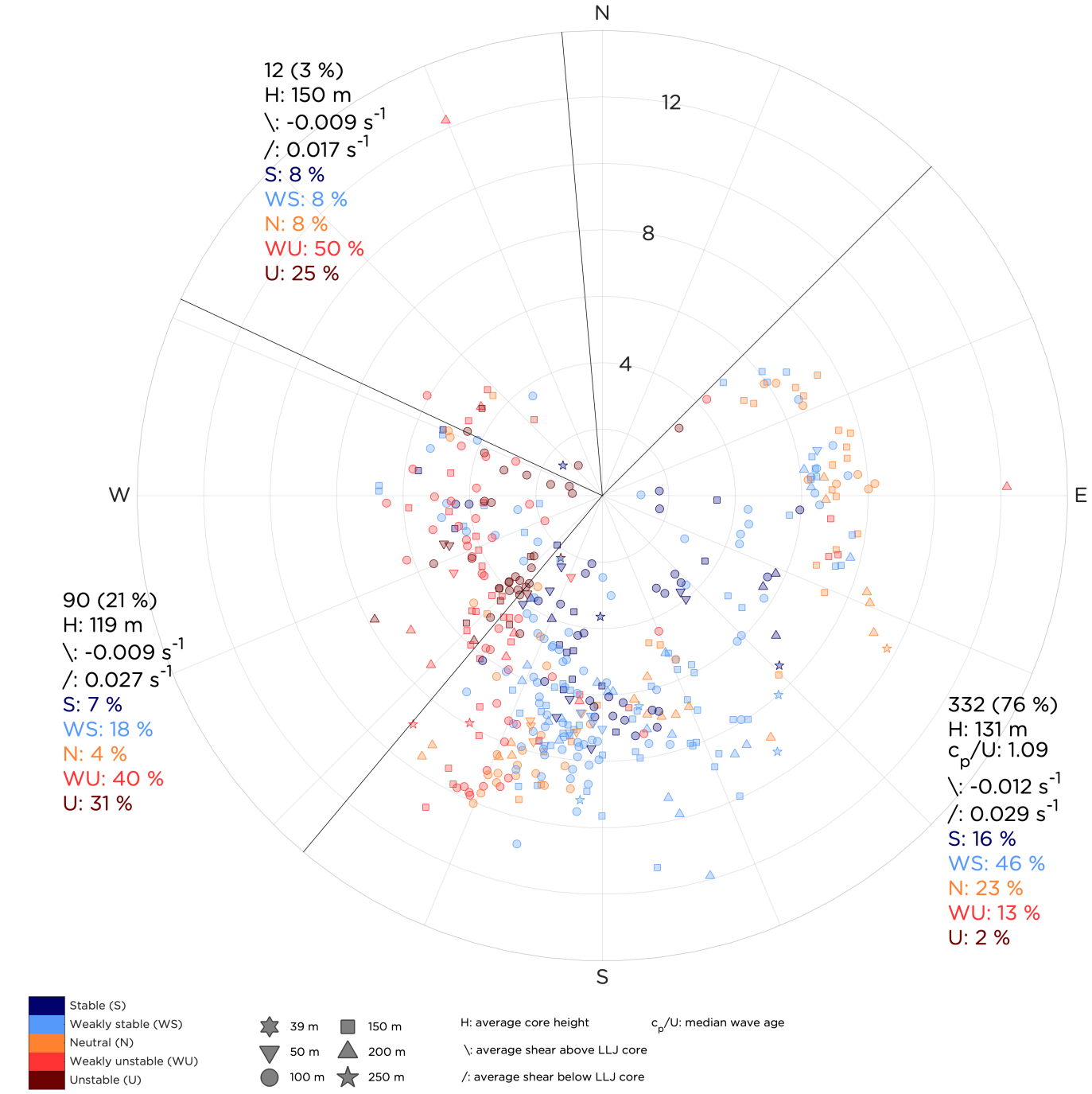

Figure S8: Overview of the seasonal occurrence of all profiles classified as weak LLJs in the season ASON. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the LLJ core. Statistics regarding the profiles are presented for three sectors.

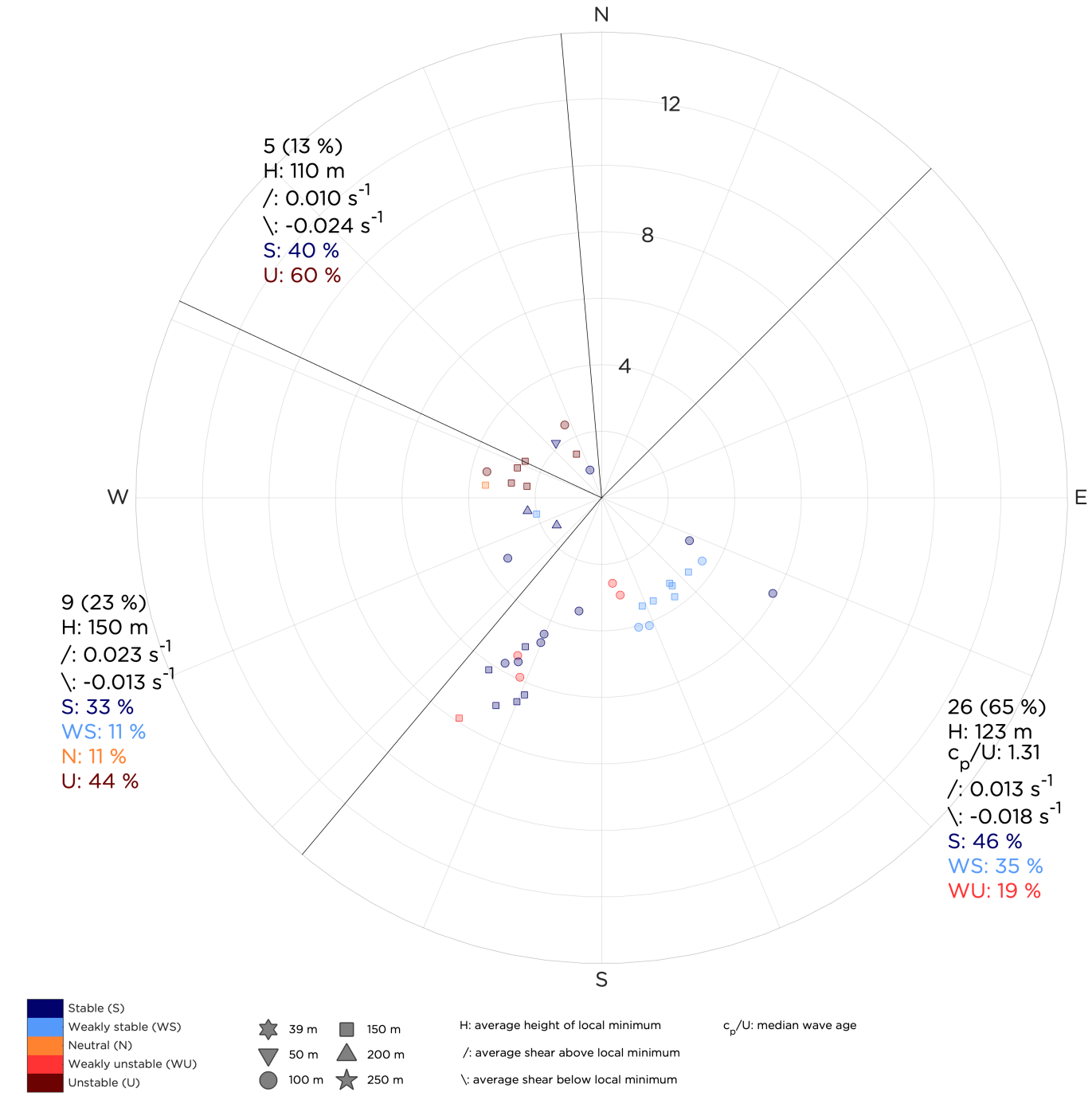

Figure S9: Overview of the seasonal occurrence of all profiles classified as LLmins in the season DJFM. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the local minimum. Statistics regarding the profiles are presented for three sectors.

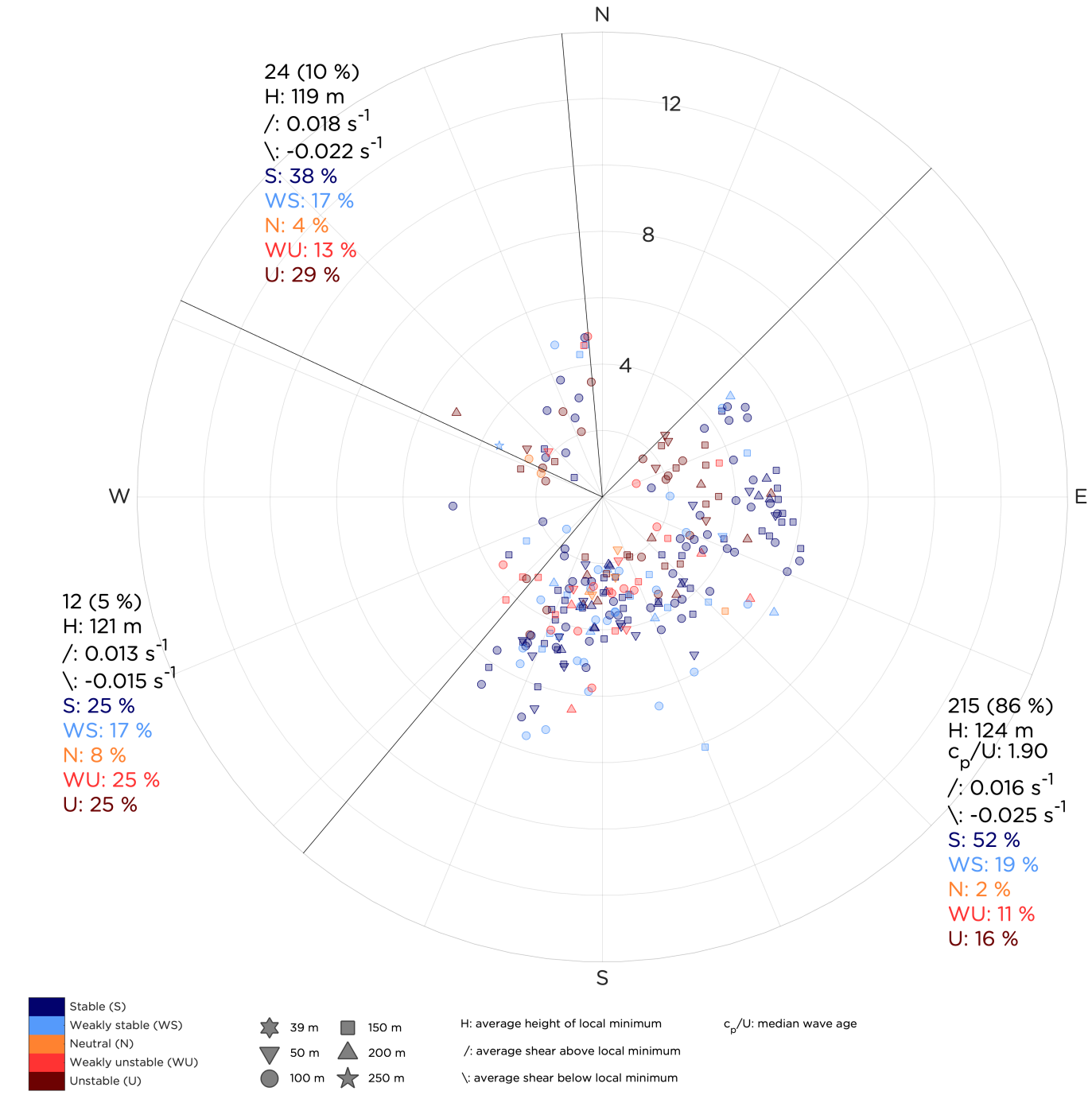

Figure S10: Overview of the seasonal occurrence of all profiles classified as LLmins in the season AMJJ. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the local minimum. Statistics regarding the profiles are presented for three sectors.

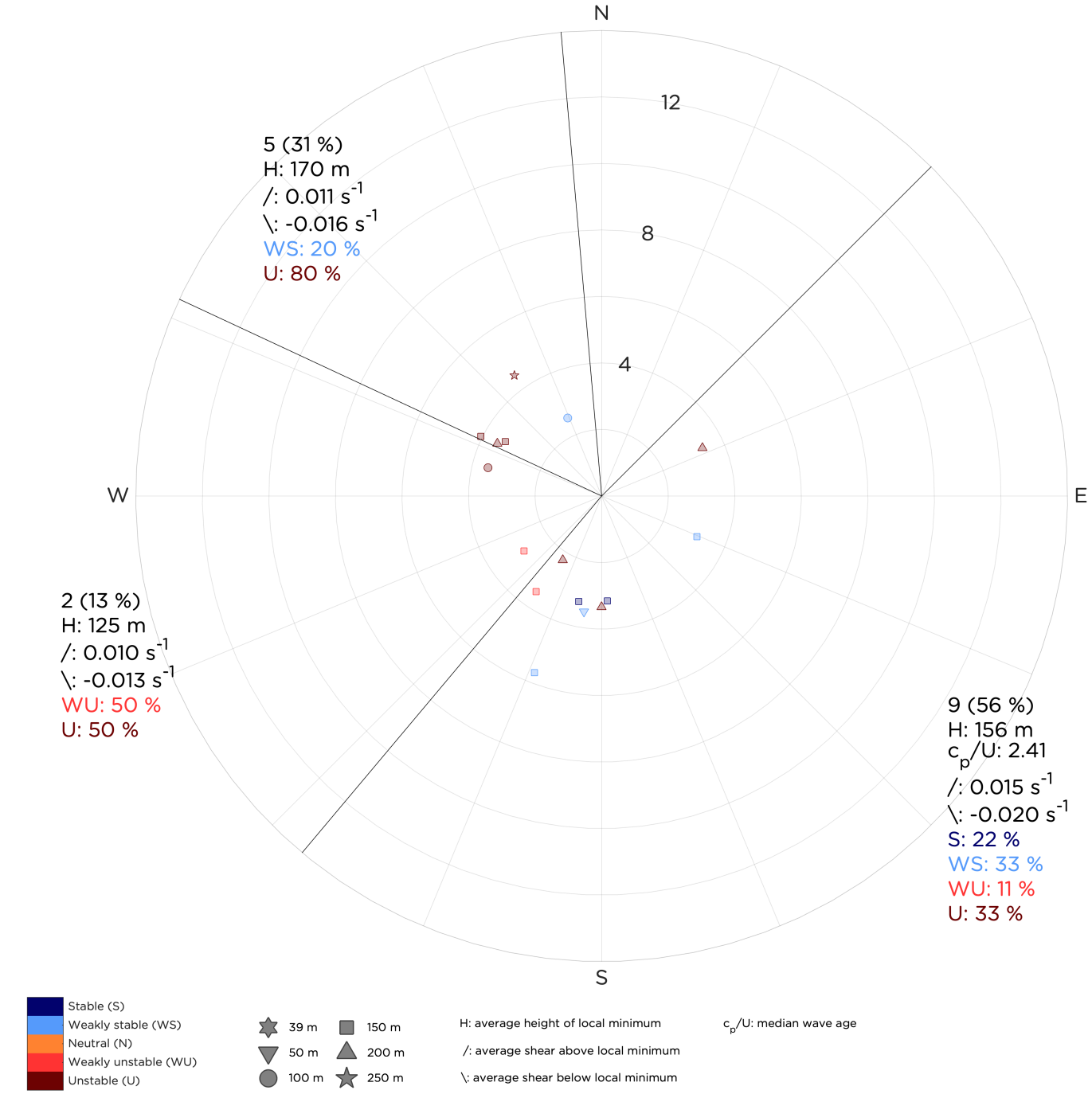

Figure S11: Overview of the seasonal occurrence of all profiles classified as LLmins in the season ASON. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. The different symbols indicate the height of the local minimum. Statistics regarding the profiles are presented for three sectors.

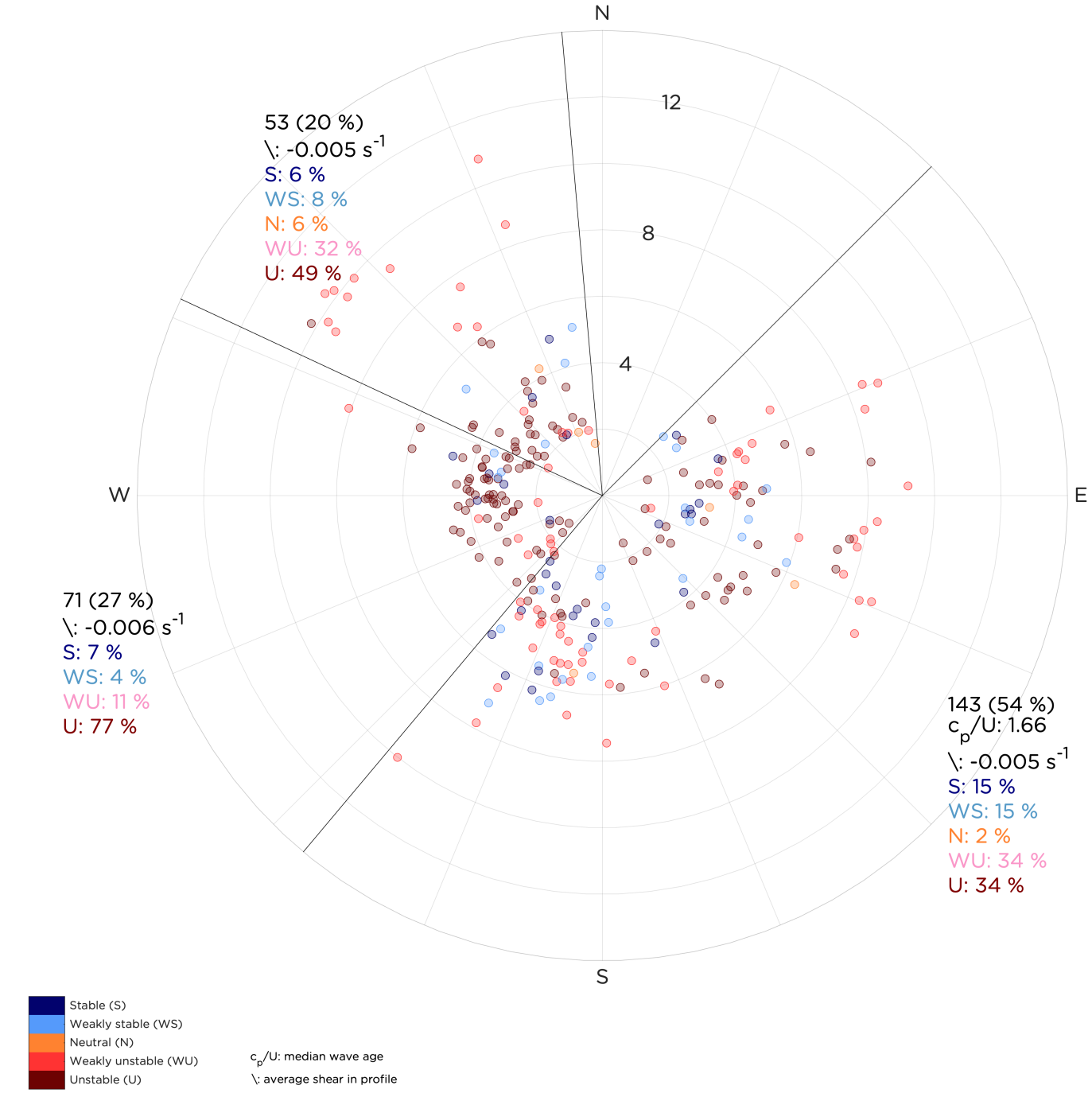

Figure S12: Overview of the seasonal occurrence of all profiles classified as negative profiles in the season DJFM. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. Statistics regarding the profiles are presented for three sectors.

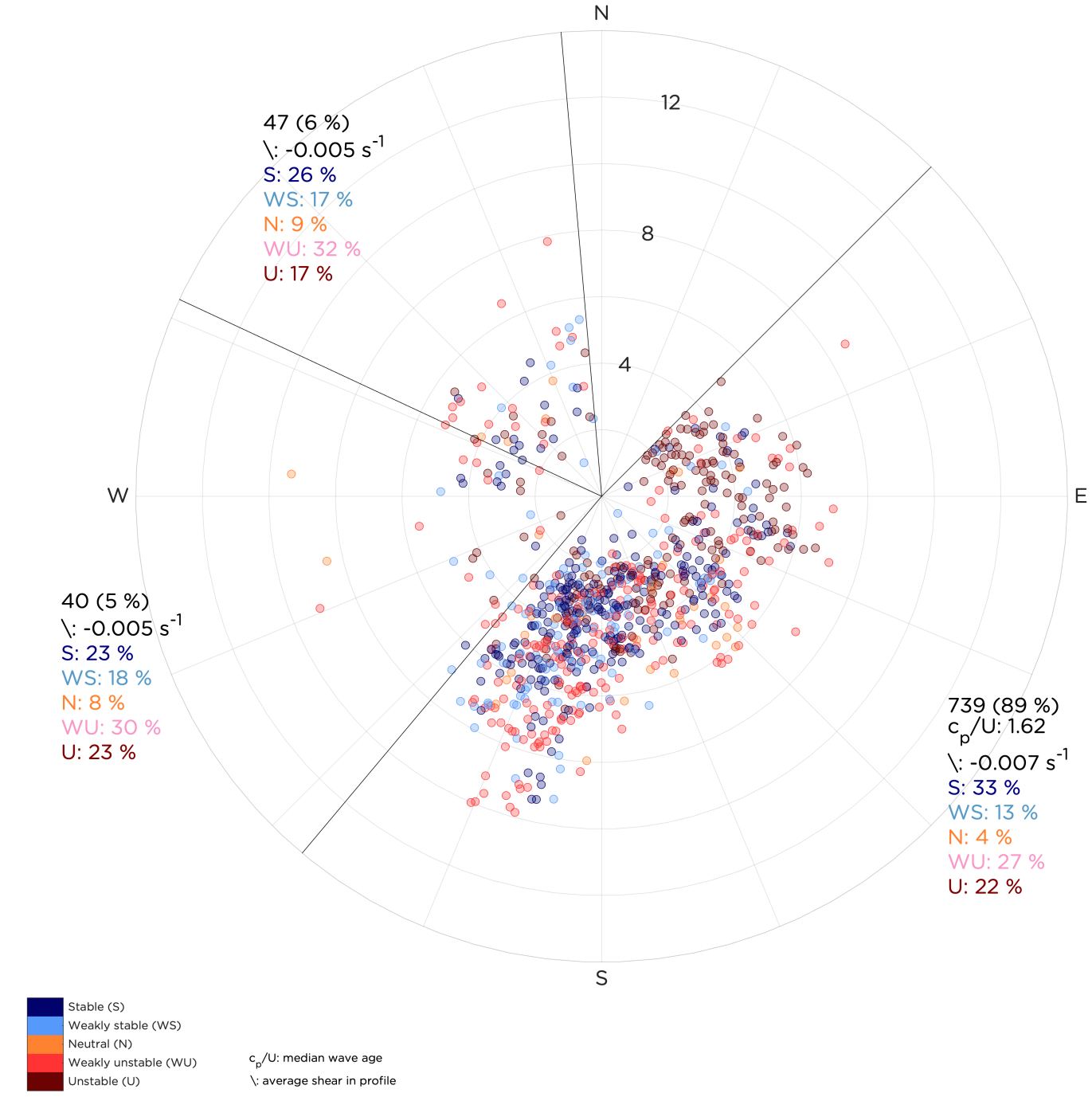

Figure S13: Overview of the seasonal occurrence of all profiles classified as negative profiles in the season AMJJ. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. Statistics regarding the profiles are presented for three sectors.

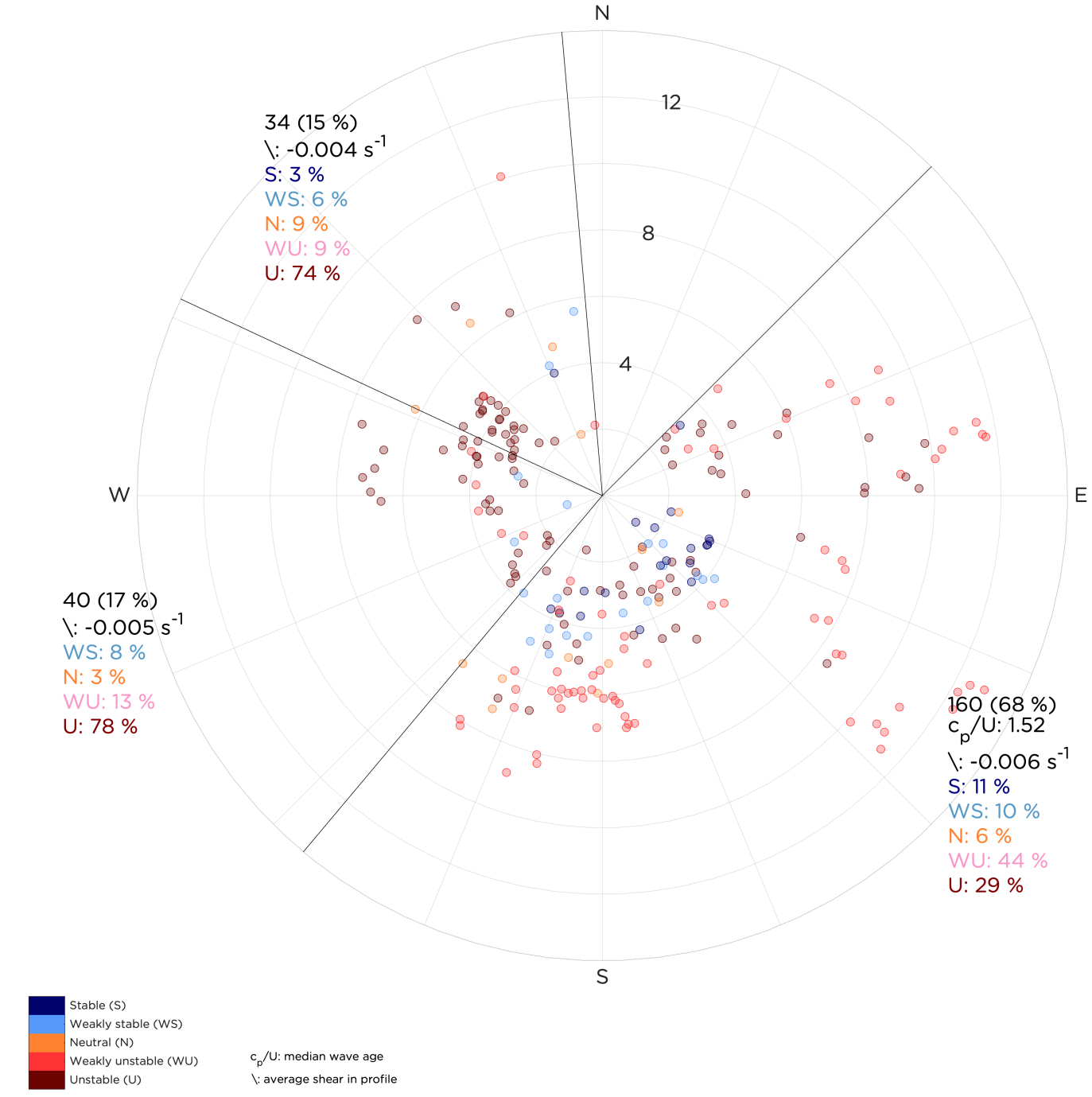

Figure S14: Overview of the seasonal occurrence of all profiles classified as negative profiles in the season ASON. The position in the polar diagram indicates the wind speed and wind direction at 10 m height, the color the stability of the atmospheric surface layer (measured at 10 m height) at the time of the occurrence of the profile. Statistics regarding the profiles are presented for three sectors.

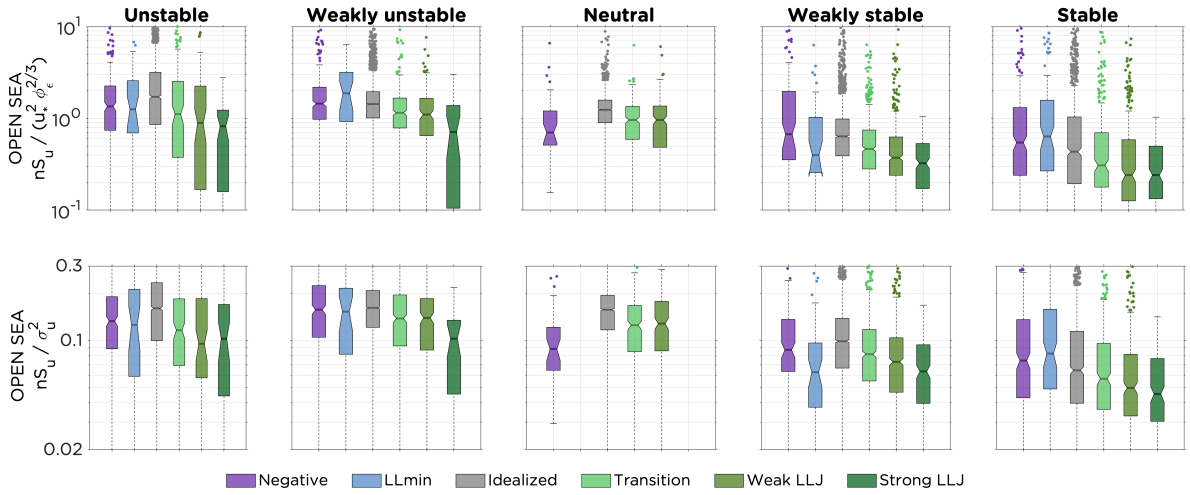

Figure S15: Comparison of distributions of normalized spectral values of u-power spectra in the open sea sector for the different wind profile classes for the selected normalized frequency 0.01, using the Kaimal et al. (1972) normalization (upper panels) and the σ_u^2 normalization (lower panels).