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Methods and Results of the Analysis of the Spatial Structure of the Siberian High /
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A methodology has been developed for quantitative assessment of the spatial structure of the Siberian High (SH) based on calculating the center of gravity of the positive sea level pressure anomaly field. On its basis and using ERA5 data, the position of the SH center of gravity, the radius of inertia (a measure of compactness), and the total intensity were calculated for the period of 1950–2025. It is shown that powerful anticyclones are localized within 40–60° N, 80–120° E in 93.8% of cases, whereas the respective value for weak ones is only 30.4%. The method was verified by the air density field (differences in mean positions $\leq 0.5^\circ$). The characteristics of seasonal and interannual variability of the SH have been quantitatively determined. A spectral analysis of the main SH parameters revealed significant periods in the variability: 9.5 years (longitude of the center) and 2.5 years (latitude of the center), which may be associated with the 11-year solar activity cycle and the quasi-biennial oscillation (QBO). The developed methodology allows monitoring the SH parameters and is applicable for diagnosing an expected position and intensity of the anticyclone from model forecast fields.

Keywords: Siberian High, center of gravity, radius of inertia, eccentricity, SHI, spectral analysis, Arctic amplification

Tab. 5. Fig. 7. Ref. 24