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Uncertainty of ENSO teleconnection in the Northern Hemisphere.

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The influences of the El Nino-Southern Oscillation (ENSO) in the Atlantic sector are relatively unclear compared with the Pacific sector. Several studies show an evolution of the ENSO teleconnection from November to February, including King et al. (2018, https://journals.ametsoc.org/doi/full/10.1175/BAMS-D-17-0020.1) who suggest that the Atlantic part of the pattern is more robust in late autumn. Using bootstrapping tests (resampling with replacement) following the approach of Deser et al. (2017, https://journals.ametsoc.org/doi/10.1175/JCLI-D-16-0844.1), we re-evaluate the uncertainty in Atlantic sea level pressure anomalies related to ENSO (based on Nino3.4) according to Nov/Dec and Jan/Feb means. Taylor diagrams are used to effectively show the spatial correlations, amplitudes and other statistical properties of the bootstrap composites relative to the observed composites. The Taylor diagrams allow us to find the bootstrap confidence intervals of the patterns and amplitudes. The analyses here confirm that for Nov/Dec means, El Nino (La Nina) is associated with the positive (negative) East Atlantic pattern, which resembles a southward shifted North Atlantic Oscillation (NAO); while the Jan/Feb El Nino (La Nina) is associated with a pattern that projects on the negative (positive) NAO. Using the bootstrap composites, we also assess the validity of applying the t-tests on the original composites. It is found that in most cases considered for the current study a t-test is able to adequately indicate (which we would only know after performing the bootstrapping) the statistical significance. We will argue that the uncertainty of the ENSO teleconnection in the North Atlantic is reduced when separated into late autumn and winter. The results extend our knowledge in the uncertainty of ENSO teleconnection which also has implication for predictability and model evaluation.