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Solar wind conditions suppressing the production of magnetosheath jets during CME occurrence

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Magnetosheath jets are dynamic pressure enhancements frequently observed in the Earth's magnetosheath. They are significant coupling elements between the solar wind and the magnetosphere of the Earth and they can be geoeffective. Jets travel anti-sunward through the magnetosheath and can impact the magnetopause. The generation of these jets is generally linked to processes at the quasi-parallel bow shock and the foreshock. We analyzed how the appearance of these jets is linked to large-scale solar wind (SW) structures, in particular coronal mass ejections (CMEs) and stream interaction regions (SIRs) and their associated high speed streams (HSSs). In our statistical analysis, we use magnetosheath jets detected by the THEMIS spacecraft between 2008 to 2020. We found that the number of detected jets is lower during the passing of CMEs. Significantly more jets are observed during SIRs and HSSs. We analyze the difference in conditions during each SW structure and compare them to the SW conditions measured during the detection of jets. We focus on SW Alfvénic Mach number and IMF cone angle, which affect the presence of the foreshock and the position of the quasi-parallel shock front. We find that jets are unlikely to appear during a mix of low Alfvénic Mach numbers and high cone angles, which are SW conditions often found during CMEs and their associated sheaths.