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Can F10.7 Index Well Present Solar EUV Flux during Current Deep Solar Minimum?

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Solar activity experienced a prolonged minimum in 2007-2009. Recently, much attention has been paid to the Sun and the space environment in current deep solar minimum. In this work, we collected SOHO/SEM EUV observations and F10.7 index to investigate solar irradiance in current deep solar minimum. We revealed F10.7 cannot present solar EUV irradiance in current solar minimum as it did in the last solar minimum. F10.7 and solar EUV flux decreased from the last solar minimum to current one with different amplitudes (larger in EUV flux). For the same F10.7, EUV flux is remarkably lower in current solar minimum than in the last one. That caused notable responses in ionospheric foF2. For the same F10.7, foF2 in current solar minimum is lower than that in the last one, further it is also lower than that in other previous solar minima and reaches the lowest values of its historical records. Therefore, F10.7 cannot indicate foF2 in current solar minimum as it did in previous several minima, which implies F10.7 cannot present solar EUV flux in current solar minimum as it did in previous minima that foF2 data cover. Both should draw our attention when improving ionospheric and EUV irradiance models.