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Derivation of the Solar Plage Index using the Flare Monitoring Telescope at the Hida Observatory

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It is well known that the solar irradiance modulates at 11-year solar cycle. There have been many arguments on the relation between the solar cycle and the earth's climate, but at least it is well established that UV/EUV directly affect the upper atmosphere of the earth. The solar UV radiation is mainly emitted by the chromospheric height, where both dark filaments and bright plages are seen. Recently Bertello, Ulrich, and Boyden (2010) developed the Ca II K plage index based on the area of the solar disk occupied by plages and active network, and found good consistency with the UV irradiance.

We try to derive a proper index of solar UV radiation using the chromospheric H-alpha images observed by the Flare Monitoring Telescope. The Flare Monitoring Telescope operates at the Hida Observatory since 1996. It obtains the full disk images of the Sun at H-alpha center and wings. In this work we analyze the H-alpha center images in order to estimate the area of dark filaments and plages. We report our method to derive the filament and plage indices, and validates the correlation with the UV radiation. We also makes separate indices for the low and high latitudes, to see their differences.