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Assessing the Performance of the Photovoltaic Cells on the Effects of Yellow Dust Events and Haze in Seoul, Korea

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We analyze the potential effects of the Asian yellow dust Events and haze on the performance of Korean photovoltaic systems. Particulate matters from the Asian yellow dust outbreaks in the deserts of Mongolia and northern China are typically transported to Korea. Haze is an atmospheric phenomenon where dust, smoke and other dry particles obscure the clarity of the sky. Hence, we conjecture that the effects of the Asian yellow dust and haze block the incident solar irradiance. The potential reduction of the solar spectral irradiance due to Asian yellow dust events and haze in Korea is investigated using a clear-sky spectral radiation model, and the performance of photovoltaic systems under reduced irradiance is estimated by using a simple analytic model representing typical photovoltaic cells. Comparison of photovoltaic performance under Asian dust events, haze and that under a clear condition is made to evaluate overall influence of the particulate air pollution, respectively.