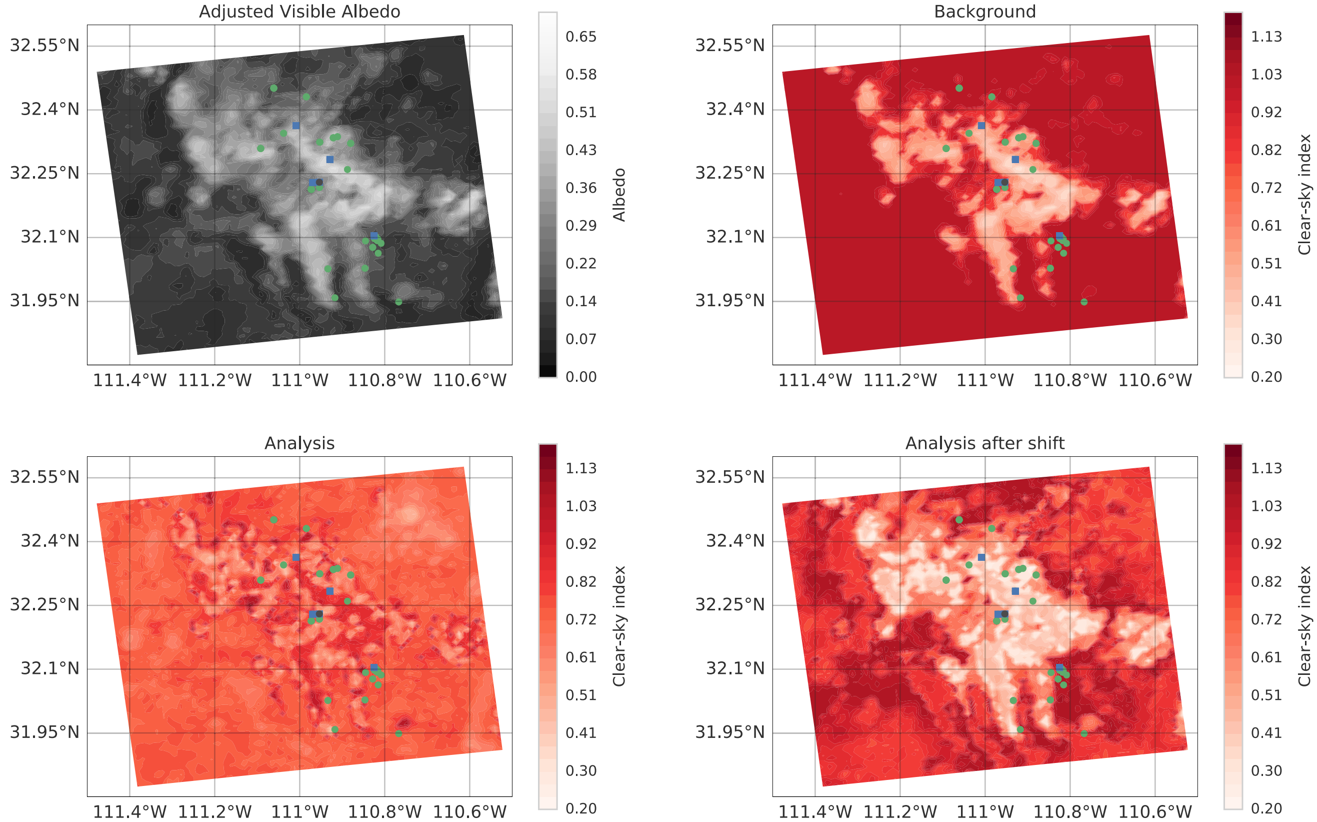

Fig. 6. Illustration of error due to parallax. The adjusted visible albedo image from the GOES-W visible channel, background clear-sky index estimate made with the UASIBS algorithm, analysis after performing OI, and analysis after shifting the satellite image are shown. The green circles are the sensors used for OI, the blue squares are the sensors used for error analysis, and the black circle in the center is the calibrated NREL MIDC sensor. We see that at sensor locations near the edge of clouds in the background, the sensors and background disagree about whether it is cloudy. This causes the OI to fail as it tries to rectify this discrepancy. If we shift the image slightly to the SW and redo the OI, we see that the sensors and background now better agree about whether the area is cloudy so that the analysis after shifting looks more reasonable.

References

[1] L. Linguet and J. Atif, "Estimating Surface Solar Irradiance from GOES Satellite with Particle Filter Model and Joint Probability Distribution," *Canadian Journal of Remote Sensing*, vol. 41, no. 2, pp. 71–85, jul 2015. [Online]. Available: http://www.tandfonline.com/doi/full/10.1080/07038992.2015.1040150

[2] J. A. Ruiz-Arias, S. Quesada-Ruiz, E. F. Fernández, and C. A. Gueymard, "Optimal combination of gridded and ground-observed solar radiation data for regional solar resource assessment," *Solar Energy*, vol. 112, pp. 411–424, feb 2015. [Online]. Available: http://www.sciencedirect.com/science/article/pii/S0038092X14006021

[3] E. Kalnay, *Atmospheric Modeling, Data Assimilation and Predictability*. Cambridge University Press, 2003.

[4] C. Rasmussen and C. Williams, "Covariance Functions," in *Gaussian Processes for Machine Learning*. MIT Press, 2005, ch. 4, pp. 79–104. [Online]. Available: http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6279030

[5] S. Wilcox and A. Andreas, "Solar Resource & Meteorological Assessment Project (SOLRMAP): Observed Atmospheric and Solar Information System (OASIS); Tucson, Arizona (Data)," nov 2010. [Online]. Available: http://dx.doi.org/10.7799/1052226

[6] A. T. Lorenzo, W. F. Holmgren, M. Leuthold, C. K. Kim, A. D. Cronin, and E. a. Betterton, "Short-term PV power forecasts based on a real-time irradiance monitoring network," in *2014 IEEE 40th Photovoltaic Specialist Conference (PVSC)*, 2014, pp. 0075–0079. [Online]. Available: http://dx.doi.org/10.1109/PVSC.2014.6925212

[7] C. K. Kim, W. F. Holmgren, M. Stovern, and E. A. Betterton, "Toward Improved Solar Irradiance Forecasts: Derivation of Downwelling Surface Shortwave Radiation in Arizona from Satellite," *Pure and Applied Geophysics*, may 2016. [Online]. Available: http://link.springer.com/10.1007/s00024-016-1302-3

[8] R. Perez, P. Ineichen, K. Moore, M. Kmiecik, C. Chain, R. George, and F. Vignola, "A new operational model for satellite-derived irradiances: description and validation," *Solar Energy*, vol. 73, no. 5, pp. 307–317, nov 2002. [Online]. Available: http://www.sciencedirect.com/science/article/pii/S0038092X02001226

[9] G. A. Vicente, J. C. Davenport, and R. A. Scofield, "The role of orographic and parallax corrections on real time high resolution satellite rainfall rate distribution," *International Journal of Remote Sensing*, vol. 23, no. 2, pp. 221–230, nov 2010. [Online]. Available: http://www.tandfonline.com/doi/abs/10.1080/01431160010006935