

THE MOTIONAL ANALYSIS OF CLOUD ALBEDO PATTERNS BY USING GMS IMAGES

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Background and Purpose

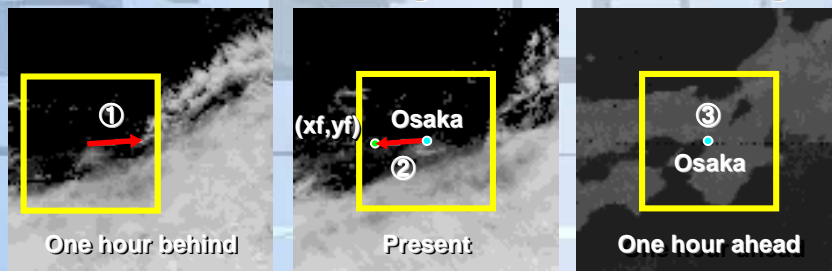
In recent years, concerns on environment protection have provided the motivation to introduce photovoltaic (PV) systems. It has an effect on the power dispatching plan when the amount of PV systems introduction increases. The main cause of the irregular change in the irradiation is the effect of clouds. Therefore, the method for estimating the solar irradiation by using GMS images may be very useful. This study attempts to formulate the forecasting of the solar irradiation by using GMS images. The purpose of this paper is to forecast the cloud albedo as a basis study for estimating the irradiation.

Methodology

Calculation of the cloud albedo flow



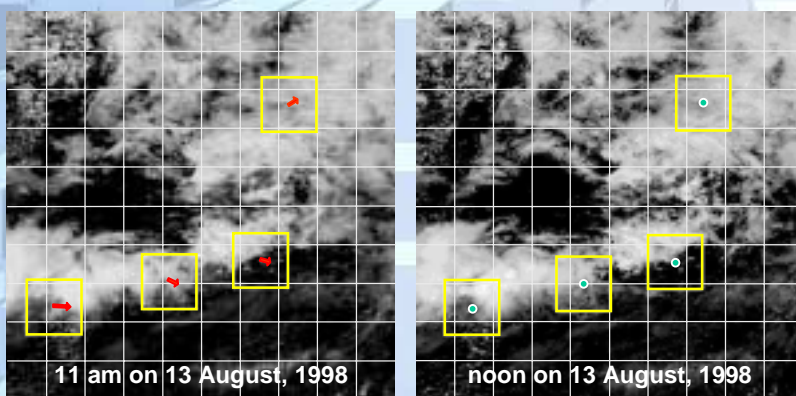
Forecasting the cloud albedo using driving drift vector



- Driving drift vector of clouds are represented to calculate a correlation between an image several hours ahead and an observed image.
- It was apply the reverse direction from Osaka at the observed image.
- The cloud on the site (xf,yf) be estimated to move Osaka for 1 hour ahead.

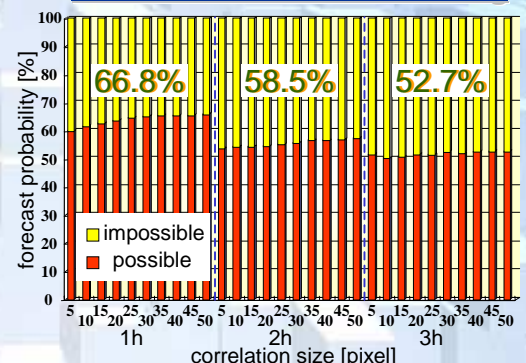
Results and Discussion

Validity of this method

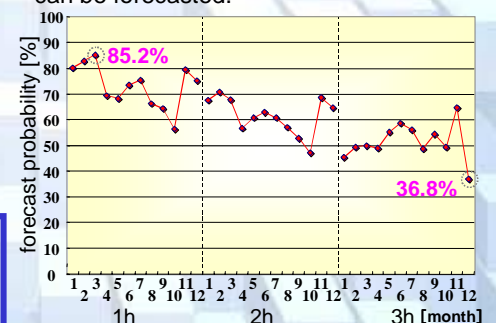


	Driving drift vector of clouds	Forecasted value	Measured value
Sapporo	(East:5, North:2)	45	46
Tokyo	(East:5, South:1)	0	0
Osaka	(East:2, South:2)	43	48
Fukuoka	(East:8, 0)	41	49

The results of the estimating



The percentage of the cloud albedo that can be forecasted.



Conclusions

- A technique to extract only cloud albedo from the GMS images has been suggested.
- If this method can be used only for a specific site and season, the forecast probability for one hour ahead can be considered high.
- The forecast for three hours ahead is a difficult issues, because the change of clouds has effect on the forecast.