**OS13B** 1821

### 1. Introduction

Near Inertial Oscillations (NIO) from 2 years of HF radar surface currents (2km, 1 hour resolution) off the south shore of Oahu, Hawaii (f = 0.71 cpd T = 33.4 hours) are described.

The spatial and time variations of dominant frequencies ( $\omega$ ) from NIOs are compared to the expected frequencies in the presence of a background flow  $(f_{eff})$ .



Figure 3. Wavelet power spectrum normalized by  $\sigma^2$  ( $\sigma^2 = 0.0247 m^2 s^{-2}$ ) averaged over the HF radar domain (df =1/2 hrs). Black solid lines denote 95% significant regions. Black and red dashed lines indicate (f = 0.71 cpd) and island trapped wave mode for Oahu ( $\omega = 0.51$  cpd). Arrow indicates the NIO event analyzed.





# Spatial variations of Near Inertial Oscillations 2. Methods



Figure 1. Hawaiian Islands and bathymetry with the two HF radars location (KAL and KOK) in red dots. Red square and black arrows indicates HF radar coverage and time-mean surface flow

A NIO from March/06/11 to March/14/11 is analyzed. Amplitudes and  $\omega$  vary in space and time • Amplitudes have maximum values of  $15 \, cms^{-1}$ 

- The background vorticity is in the **O**(1)
- Peak  $\omega$  and  $f_{eff}$  are found between 0.7f and 1.2f



Figure 5. Maximum a)NI amplitudes and mean b)3 day low-passed vorticity and surface currents, c)peak  $\omega$  and d)  $f_{eff}$  during the event.



NIO are band passed from HF surface detided currents. A morlet wavelet power spectrum is then used to obtain the peak frequencies in time and space of NIO. The peak  $\omega$  is then compared with  $f_{eff}$ , calculated from the 3-day low pass surface currents.



## 4. Key Points

•  $\omega$  of a NIO varies in time and space, at low  $R_{\circ}$ , variations are due to the interaction between the NIO and a background flow For the NI event analyzed, areas of mean negative vorticity have better correlation between peak  $\omega$  and  $f_{eff}$  than in areas of mean positive vorticity



### References:

Oceanography, 15(5), 544-565.

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averaged over HF domain. Red lines indicate the  $\pm 0.25 f$  band pass filter used to extract NI currents.