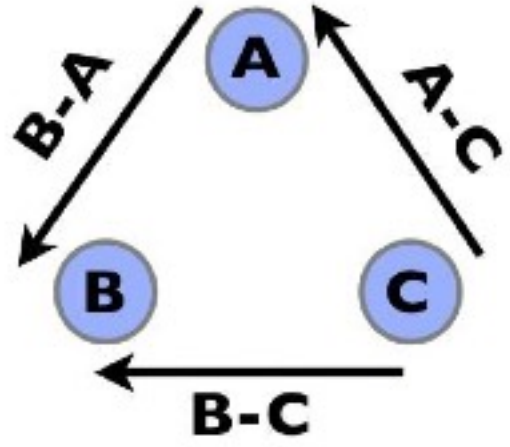
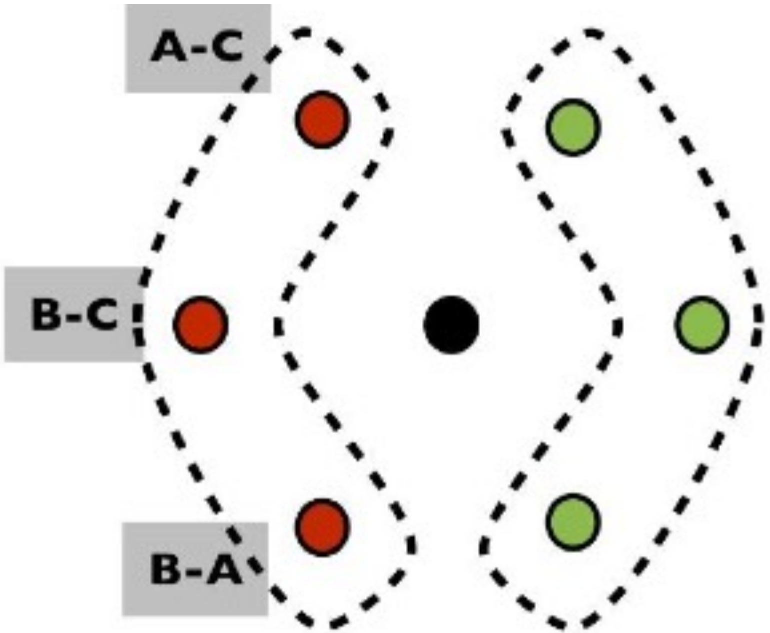
non-redundant
triangular array





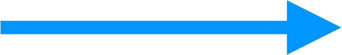
Martinache (2013)

reverse first baseline

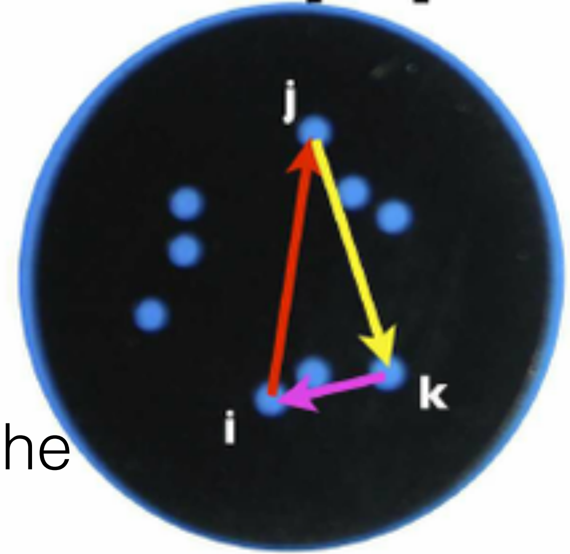
-1

1

1

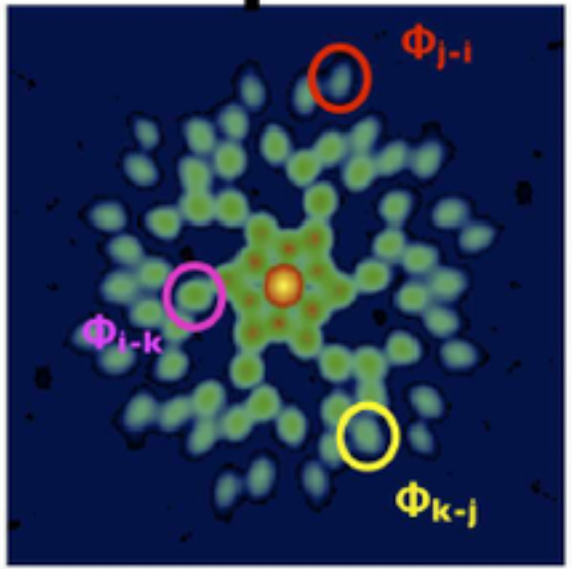


NRM pupil



Martinache (2011)

uv plane



uv phase relations

$$\Phi(2\text{-}1) = \Phi(2\text{-}1)_0 + (\varphi_2 - \varphi_1)$$

$$\Phi(3\text{-}2) = \Phi(3\text{-}2)_0 + (\varphi_3 - \varphi_2)$$

$$\Phi(1\text{-}3) = \Phi(1\text{-}3)_0 + (\varphi_1 - \varphi_3)$$

measured = intrinsic + atmospheric

Closure-phase

Want an observable which is independent of phase errors ($\boldsymbol{\varphi}$).

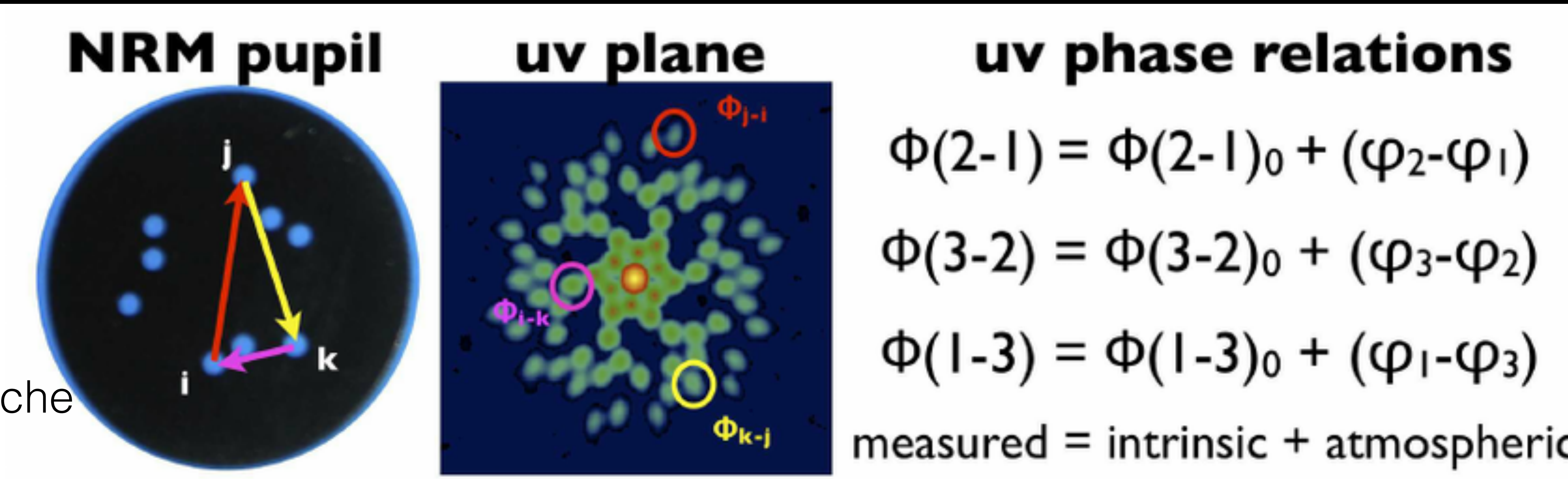
$$\boldsymbol{\Phi} = \boldsymbol{\Phi}_0 + \mathbf{A} \bullet \boldsymbol{\varphi} \qquad \mathbf{K} = \begin{bmatrix} 1 & 1 & 1 \end{bmatrix}$$

reverse first baseline

$$\mathbf{A} = \begin{bmatrix} 0 & -1 & 1 \\ 1 & 0 & -1 \\ -1 & 1 & 0 \end{bmatrix}$$

Multiply by a transfer matrix **K** such that $\mathbf{K} \bullet \mathbf{A} = 0$

Then $\mathbf{K} \bullet \boldsymbol{\Phi} = \mathbf{K} \bullet \boldsymbol{\Phi}_0$

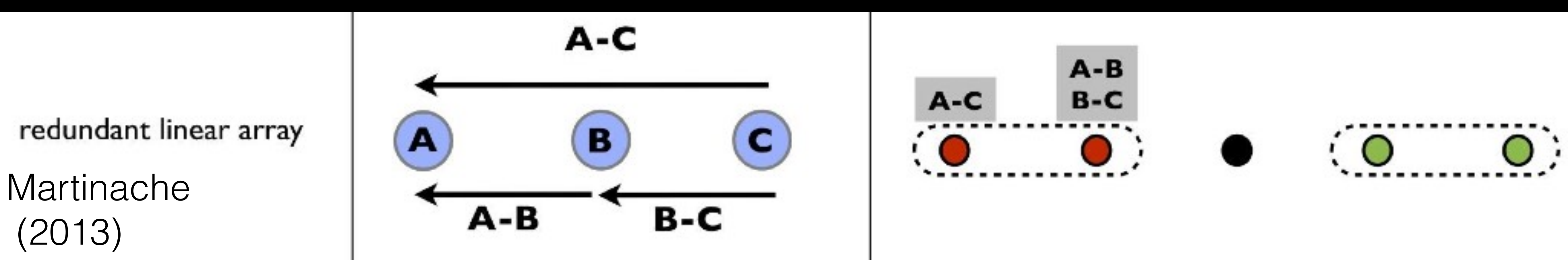


Martinache (2011)

Redundant array

For redundant apertures, phase errors add:

$$\phi = \mathrm{Arg}[\exp i\,(\phi_0 + \varphi^A - \varphi^B) + \exp i\,(\phi_0 + \varphi^B - \varphi^C)]$$



Martinache (2013)