A : image — A(nr, nc, 3)

imagesc(A) — A(nr, nc, 1) ×

colormap(gray) — A(nr, nc)

Matlab notes for HW #5

```
cm = zeros(256,3)
for i = 1 : 256
    cm(i,1) = i/256 ;
    cm(i,2) = i/256 ;
    cm(i,3) = i/256 ;
    end
image(A)
colormap(cm)
```

units
ftmgeo
radians

RPC:
assumes
decimal
degrees

EXAM REVIEW

polynomial interpolation
spline
quaternion, SLERP
QB wood. equation
variations on ↑
extracting angles from matrix
error propagation
compute nucleosines
Forstner not req.
projecting $Q_{\Delta h} \rightarrow l_{,s}$
CE/LE using MVN
parameter selection, dependency
correlation
condition #

QB resect
RPC methods
normalization
regression, singular
validation
rectification
pyramid

---

active
SAR
beamwidth
1D, echo ranging
pulse compression
focus in range
coded waveform

chirp, LFM

$\tau \Leftrightarrow \frac{1}{B}$

range, azimuth

PRF

azimuth compression (chirp)

range resolution

$\frac{c\tau}{2}$, $\frac{c}{2B}$

Ground range resolution

Az. resolution L, $\frac{L}{2}$

ERS 1,2

azimuth waveforms

doppler center freq.

ERS data

focus data

FT, (FFT) Freq. Dom.

Time Dom.

demodulation

GCP's

corner reflectors

Burbank

demodulation mix with sinusoid @ radar CF

$\Rightarrow$ baseband

SAR geopositioning

range eqn.
doppler eqn. $\begin{pmatrix} X \\ Y \\ Z \end{pmatrix}$
height constraint

Strip mode
Spot light

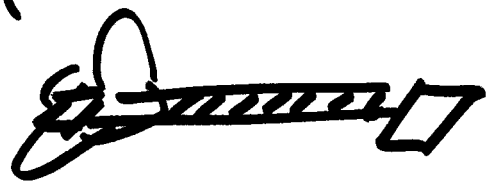
IF interferometry

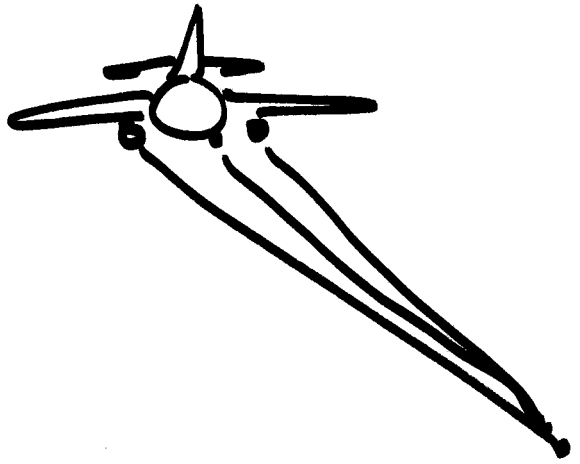
SAR interferometry

one-pass

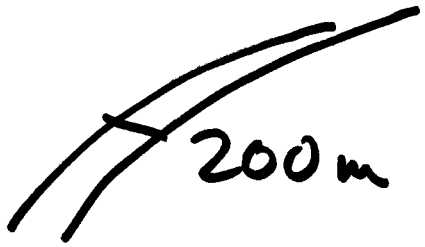
two-pass

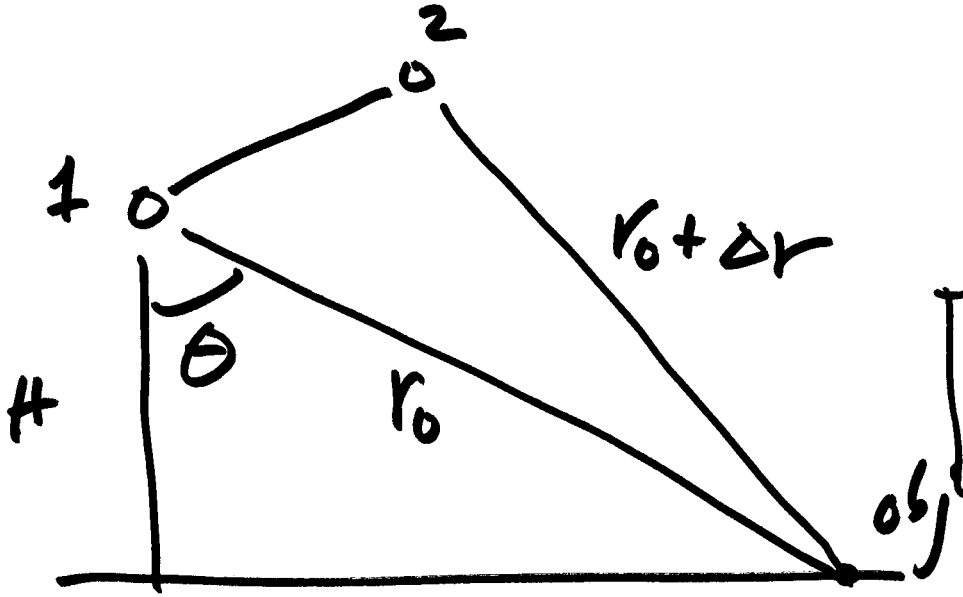
one-pass : SRTM





two-pass :





$$\phi = \phi_1 - \phi_2$$

$$\boxed{\phi = -\frac{4\pi}{\lambda}\Delta r}$$

$$\phi_1 = \underbrace{\left(\frac{2r_0}{\lambda}\right)2\pi}_{\text{distance}} + \underbrace{\phi_{obj}}_{\sim \text{random}}$$

$$\phi_2 = \frac{4\pi}{\lambda}(r_0+\Delta r) + \phi_{obj}$$

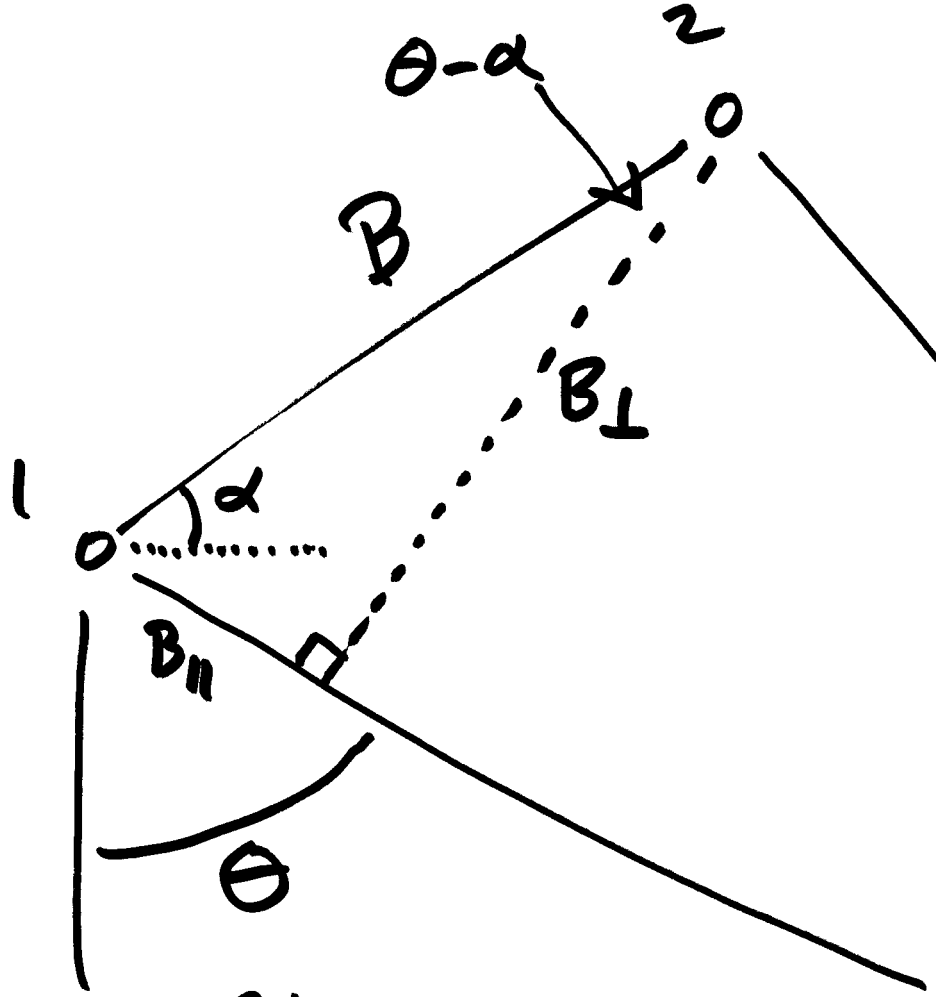
$d\phi$, ϕ Interferometric phase

$$\frac{H}{r_0} = \cos\theta$$

$$H = r_0\cos\theta$$

$$\frac{dH}{d\theta} = -r_0\sin\theta$$

$$\underline{d\theta = \frac{dH}{-r_0\sin\theta}}$$



$$\phi = \frac{4\pi}{\lambda} B_{\parallel}$$

$$\phi = \frac{4\pi}{\lambda} \cdot B \sin(\theta - \alpha)$$

$$\frac{d\phi}{d\theta} = \frac{4\pi}{\lambda} \underbrace{B \cos(\theta - \alpha)}_{B_{\perp}}$$

far field assumption

$$\Delta r = B_{\parallel}$$

$$B_{\parallel} = B \sin(\theta - \alpha)$$

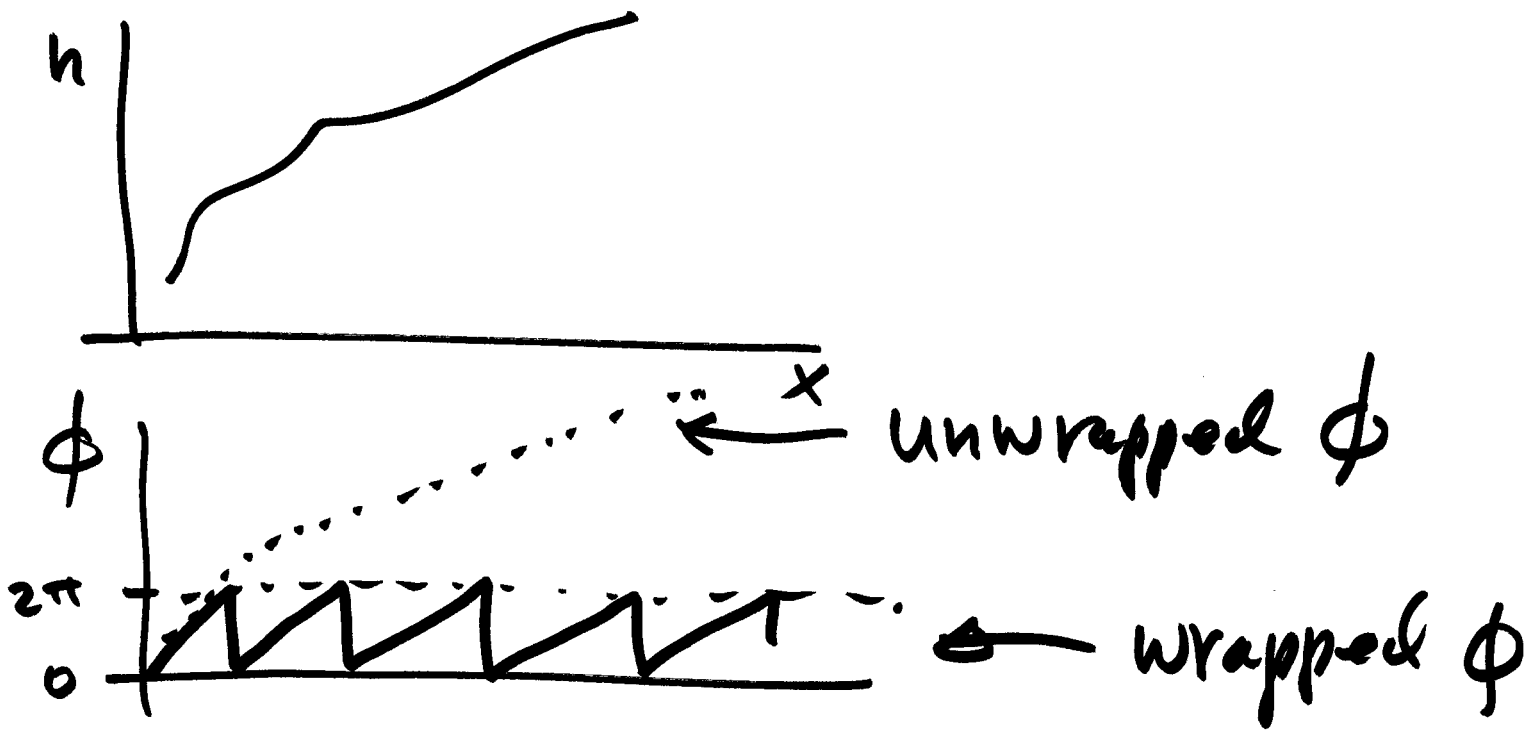
$$B_{\perp} = B \cos(\theta - \alpha)$$

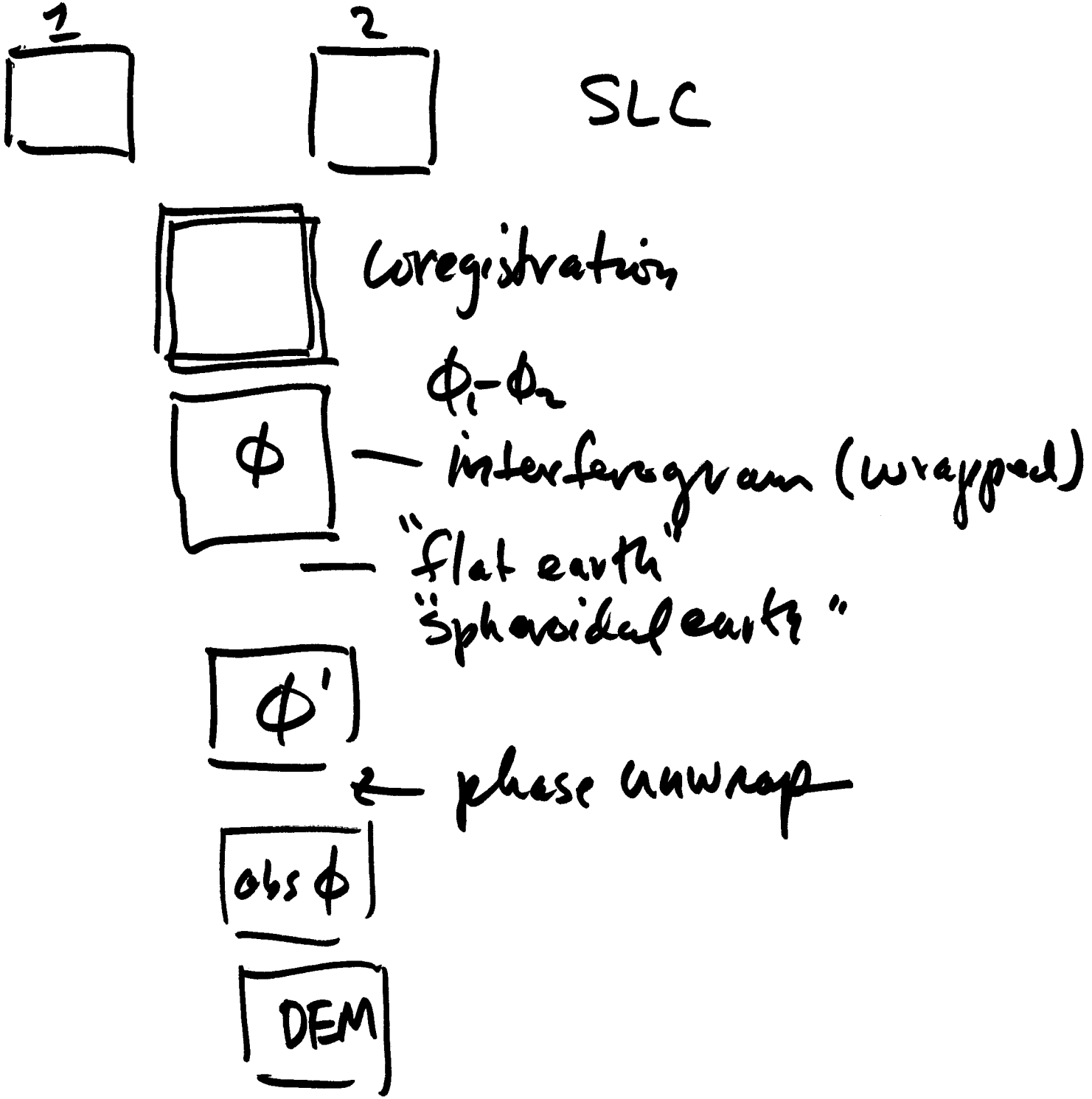
$$\frac{d\phi}{d\theta} = \frac{4\pi}{\lambda} B_{\perp}$$

$$d\phi = \frac{4\pi}{\lambda} B_\perp \cdot d\theta$$

$$d\phi = \frac{4\pi}{\lambda} B_\perp \cdot \frac{dH}{-r_0 \sin\theta}$$

$$\boxed{\frac{d\phi}{dH} = -\frac{4\pi}{\lambda} B_\perp \frac{1}{r_0 \sin\theta}}$$


h
x
ϕ
unwrapped ϕ
2π
0
wrapped ϕ


1
2
SLC
coregistration
$\phi_1 - \phi_2$
ϕ
interferogram (wrapped)
"flat earth"
"spheroidal earth"
ϕ'
phase unwrap
obs ϕ
DEM