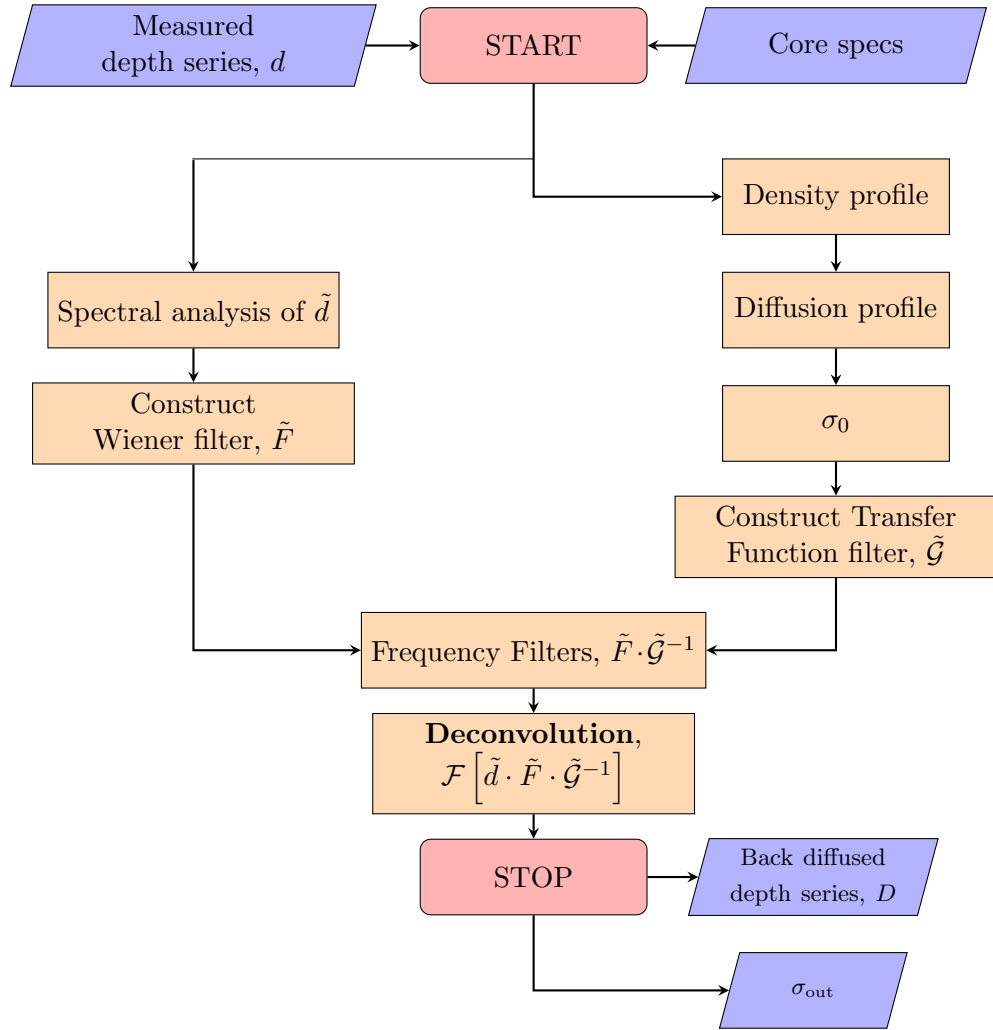Figure 0.1: For Introduction

Figure 0.2: (For beginning of Signal Analysis and Comp. Methods)
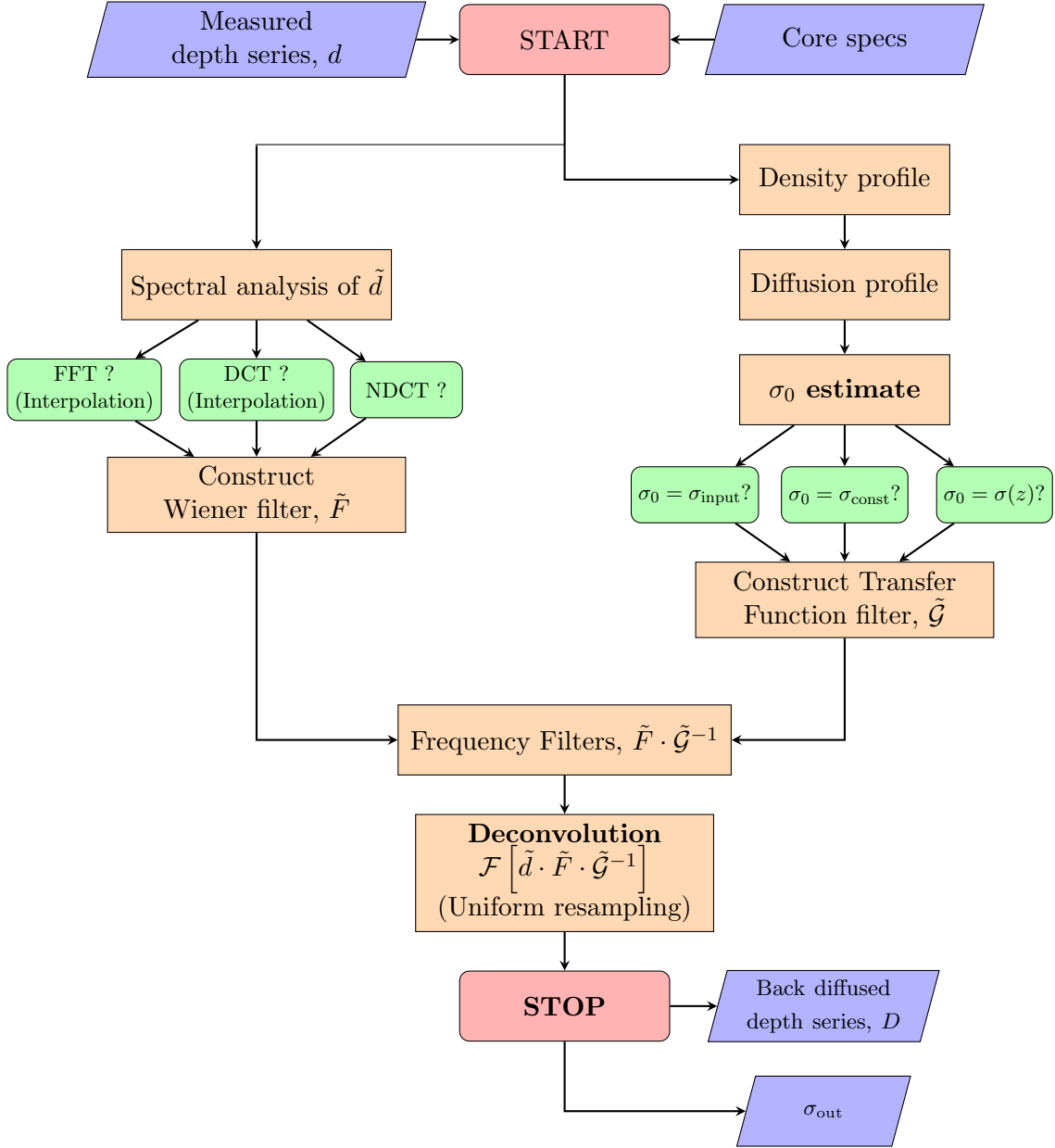
Figure 0.3: For Method

constraints

σ_0 estimate

Inputs:
$\Delta,\ \epsilon,\ N_\sigma$

Construct $\bar{\sigma}_0$ grid,

$$\bar{\sigma} = \begin{bmatrix} \sigma_0 - \left(\frac{N_\sigma}{2} - 1\right)\Delta \\ \vdots \\ \sigma_0 - \Delta \\ \sigma_0 \\ \sigma_0 + \Delta \\ \vdots \\ \sigma_0 + \left(\frac{N_\sigma}{2} - 1\right)\Delta \end{bmatrix}$$

Wiener filter, $\tilde{F}$

for σ **in** $\bar{\sigma}$:

Deconvolution,
$D = \mathcal{F}\left[\tilde{d} \cdot \tilde{F} \cdot \tilde{\mathcal{G}}(\sigma)^{-1}\right]$

Count N_{peaks} in D,
under constraints

if $N_{peaks} \leq 33$:
$\quad P_i = 0,$
else:
$\quad P_i = 1$

$\bar{P} = [P_0,\ P_1,\ ...,\ P_{N-1}]$

$$\bar{\sigma} = \begin{bmatrix} \sigma_{min} \\ \sigma_{min} + \Delta \\ \vdots \\ \sigma_{max} - \Delta \\ \sigma_{max} \end{bmatrix}$$

Construct new $\bar{\sigma}$ grid with:

$\sigma_{min} = \mathbf{max}(\bar{\sigma}(P_i == 0)),$
$\sigma_{max} = \mathbf{min}(\bar{\sigma}(P_i == 1)),$
$\Delta = \frac{\sigma_{max} - \sigma_{min}}{N_\sigma - 1}$

if $\sigma_{max} - \sigma_{min} > \epsilon$

if $\sigma_{max} - \sigma_{min} \leq \epsilon$

STOP

$\sigma_{\text{final}} = \sigma_{min},$
$D_{opt} = D(\sigma_{\text{final}})$