Observations/data collection

Survey $\rightarrow$ {raw data}
$\mathcal{S}^{\text{survey}}$ (detection efficiency, Ω, $\Delta\lambda$, ...)

Data processing

Parent catalog $\rightarrow$ $\{i, \mathbf{q}_i\}$
$\mathcal{S}_C^{\text{parent}}(\mathbf{q})$

Sample selection criteria

Catalog or sample $\rightarrow$ $\{i, \mathbf{q}_i\}_{\text{subset}}$
$\mathcal{S}_C^{\text{parent}}(\mathbf{q}) \times \mathcal{S}_C^{\text{sample}}(\mathbf{q})$