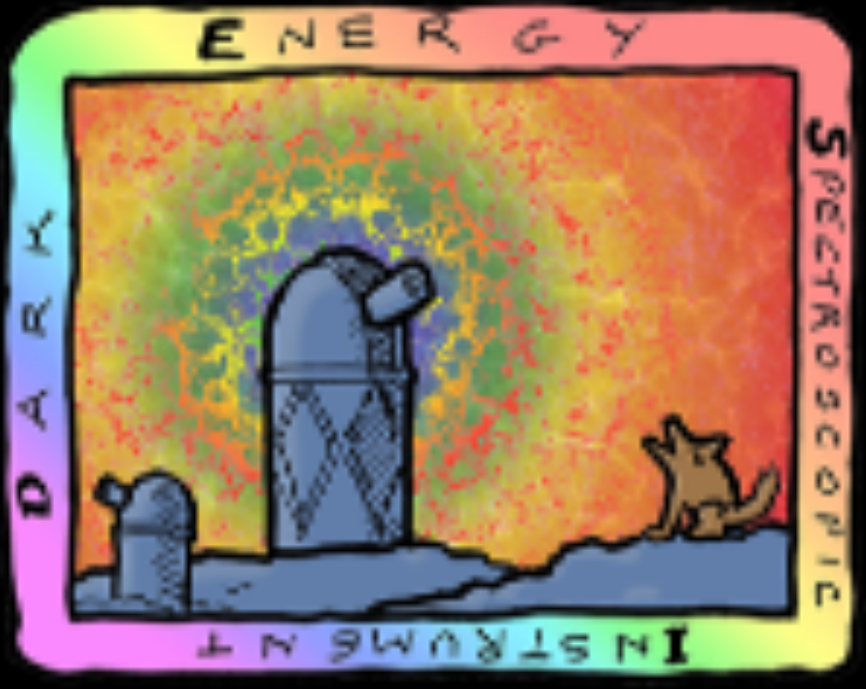

DARK ENERGY SPECTROSCOPIC INSTRUMENT

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DESI VI. Cosmological constraints - Aug 2024 XII ICNFP @ Crete, Greece, 2024

Uendert Andrade (UMichigan)

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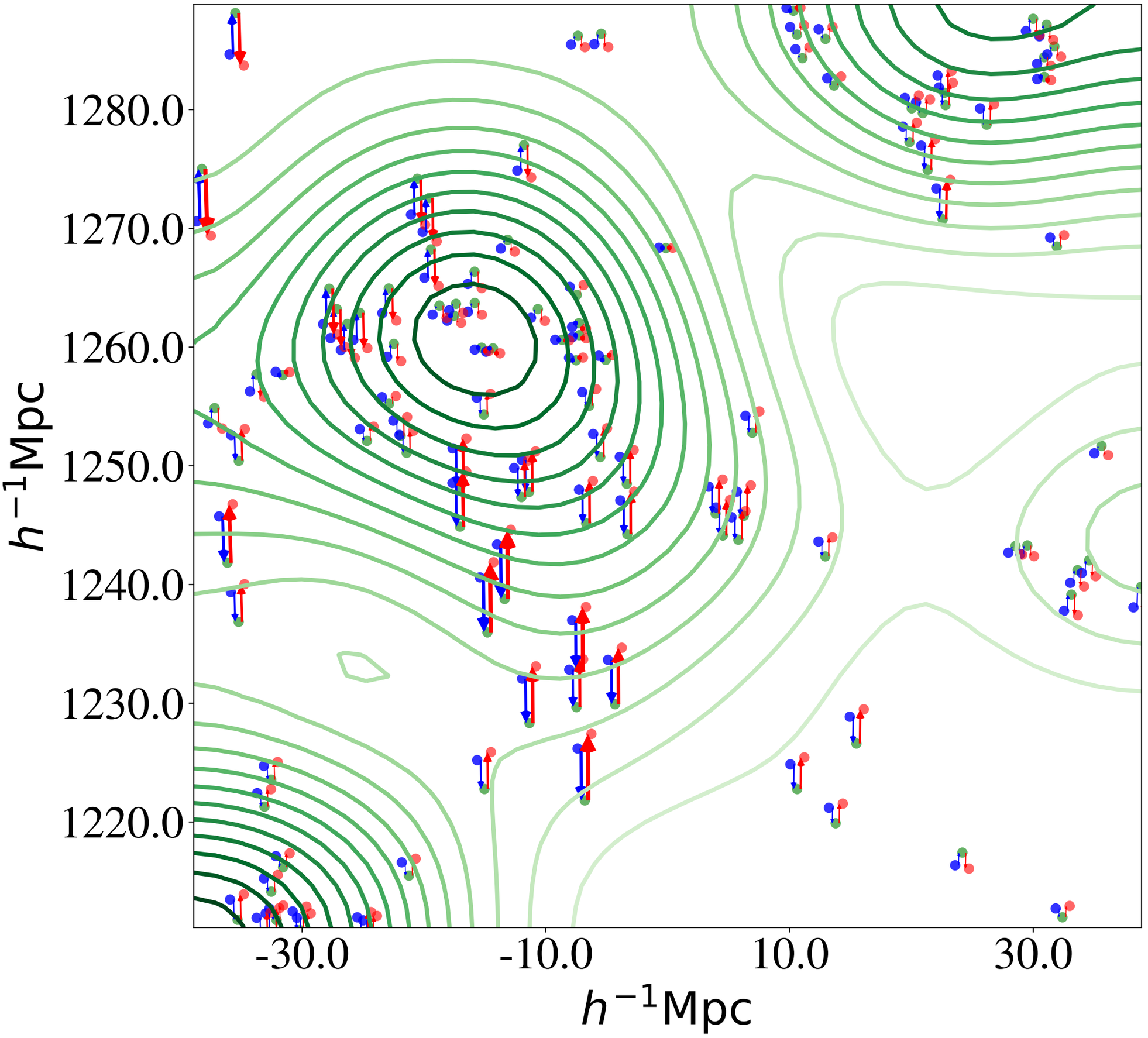
Second step


1280.0
1270.0
1260.0
1250.0
1240.0
1230.0
1220.0
h^{-1}Mpc
-30.0
-10.0
10.0
30.0
h^{-1}Mpc

S Brieden et al (2020): arXiv:2006.10857

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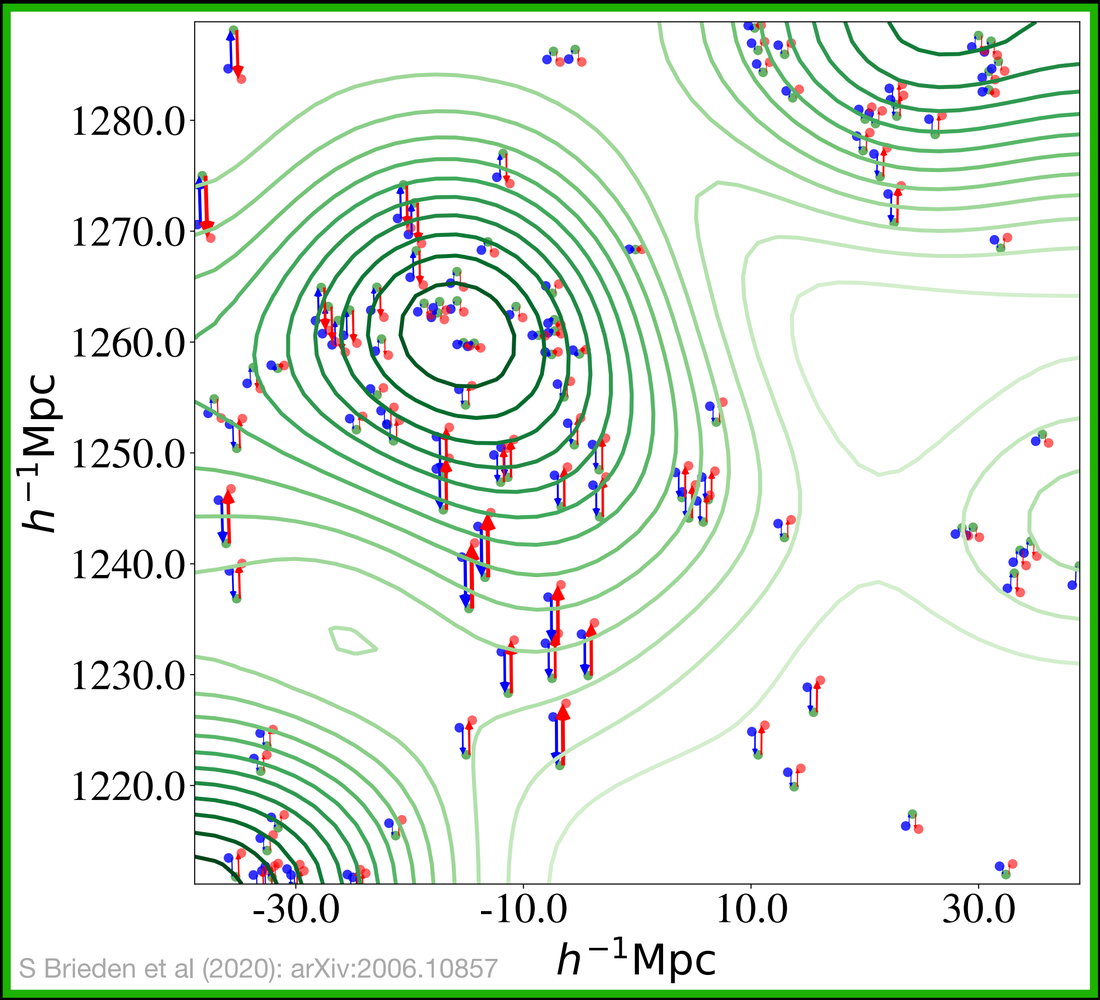
How is the DESI BAO analysis different?

- **Second step**: RSD shift



The so-called displacement field: $\Psi = \nabla\phi$

$$\nabla \cdot \Psi = -\frac{\delta_g}{b_1}\,, \qquad \vec{r} = \vec{x} + f\left(\Psi \cdot \hat{\mathbf{r}}\right)\hat{\mathbf{r}}$$

$$\mathbf{r}' = \mathbf{r} - f^{\mathrm{fid}}(\Psi \cdot \hat{\mathbf{r}})\hat{\mathbf{r}} + f^{\mathrm{blind}}(\Psi \cdot \hat{\mathbf{r}})\hat{\mathbf{r}}$$

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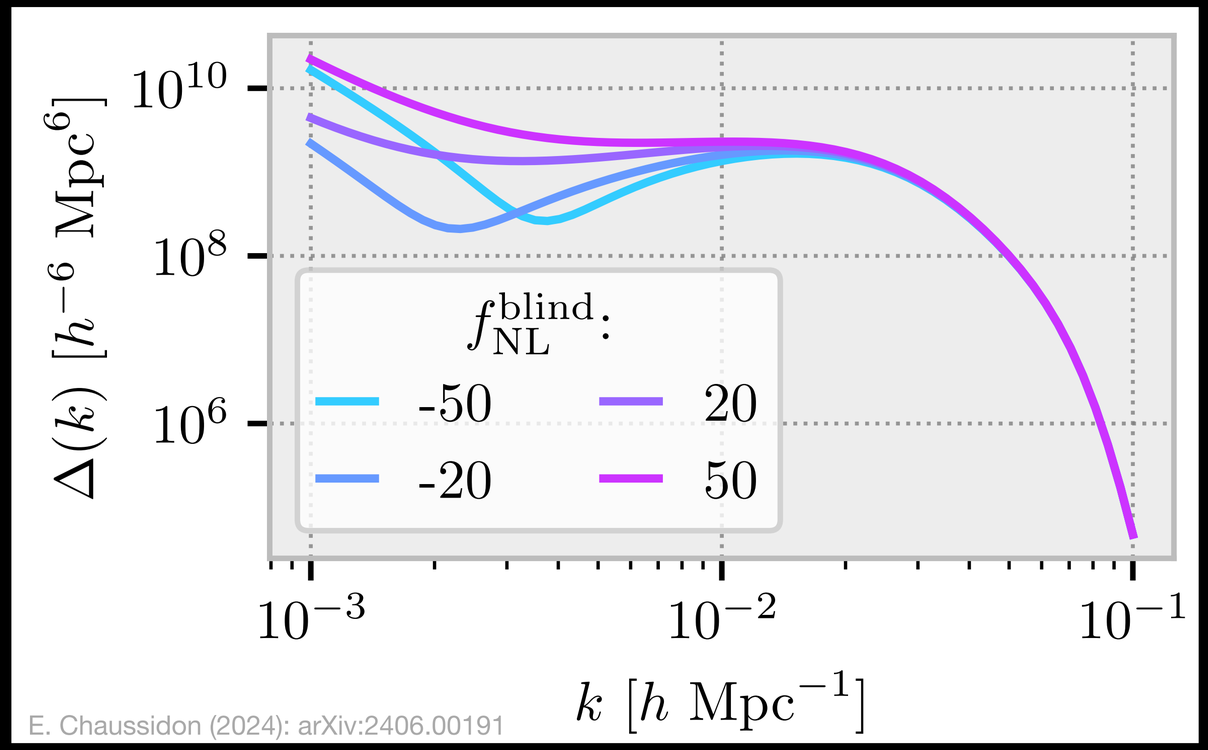
How is the DESI BAO analysis different?

- **Third step**: weights-based blinding $f_{\rm NL}$



E. Chaussidon (2024): arXiv:2406.00191

$$P(k,z) = \left(b(z) + \frac{b_\Phi(z)}{\alpha(k,z)} f_{\rm NL}^{\rm loc} \right)^2 P_{\rm lin}(k,z)$$

$$w_{\rm blind}(k) = \frac{b_\Phi f_{\rm NL}^{\rm blind}}{b\alpha(k)} \times \hat{\delta}^r(k)$$

Alters the measured power spectrum at large scales by including in the catalog an *additional set of* ***weights***, multiplied by the traditional ones.