Requirements to be included in the META/CMC PDFs
Check-list that these are fulfilled by HERAPDF2.0

- Are based on published data accompanied by a published paper **arXiv:1506.06042**
- Theoretical cross sections are evaluated up to two loops in \alpha-s: **yes NNLO as well as NLO versions exist**
- In a general –mass variable flavour scheme with up to 5-flavours: **yes Thorne-Roberts Optimized**
- Using benchmarked code: **yes QCDNUM**
- The central value **of \alpha_s(M_Z) =0.118**
- **Additional sets are available for 0.117 and 0.119** (as well as many other values in the _ALPHAS sets)
- **Charm and beauty pole masses are used compatible with world average values** (and variations are supplied)
- **Jets are only included for HERA data and to NLO**, not at NNLO
- **Experimental errors are evaluated using \Delta\chi^2=1 in the _EIG sets** but **other sorts of variation are available in the _VAR sets**. Experimental correlated systematic errors have been included using the standard procedure (**and are usually multiplicative**)
- **For the _EIG sets the Hessian method should be used**. There is a central set mem=0 and 28 further sets representing 14 eigenvectors
- **For the _VAR sets there is a central set plus 13 variations, we suggest the following:**

The central of the _VAR sets is the same as for the EIG set

mem=0 => NNLO central (fs=0.4,mb=4.5,mc=1.47,q20=1.9,q2min=3.5,a_s(MZ)=0.118) ; NLO central has mc=1.43

The next 12 variations mem=1,12 of the VAR set represent up and down variations of model parameters and can thus be treated like the EIG, so take VAR 1,2 as and add it to EIG as EIG 29,30 and so on as follows:

EIG 29, 30: mem=1 => fs=0.3; mem=2 => fs=0.5;

EIG 31, 32: mem=3 => fs=hermesfs-03; mem=4 => fs=hermesfs-05

EIG 33, 34: mem=5 => q2cut=2.5; mem=6 => q2cut=5.;

EIG 35, 36: mem=7 => mb=4.25; mem=8 => mb=4.75;

EIG 37, 38: mem=9 => mc=1.41; mem=10 => mc=1.53; NNLO

EIG 37, 38: mem=9 => mc=1.37(Q20=1.6); mem=10 => mc=1.49; NLO

EIG 39, 40: mem=11 => Q20=1.6, mc=1.47); mem=12 => Q20=2.2, mc=1.53/1.49;

(in principle choices 33,34 and 39,40 do not really reflect the variations corresponding to 1sigma precision, as they are just ad hoc choices, but we think it is simplest to consider them as EIG)

--> while for variation 13: mem=13 =>Duv;

there are 2 options:

i) conservative way is to symmetrise: take up and down variations EIG41 and 42 both with the modulus of the difference between mem=13 and central, but opposite sign

ii) asymmetric error with var down = central, variation up EIG 42 mem=13 => Duv

We think option ii) is probably best.