A detector mounted alignment system for QD0 (functionally equivalent to the eccentric cam based mover system [7] developed for the FFTB and LCLS and used as well at ATF2) should fulfill the following requirements:

- Number of degrees of freedom: 5 (horizontal x, vertical y, roll α, pitch ϕ, yaw ψ)
- Range per x,y degrees of freedom: $\pm$ 2 mm
- Range per α,ϕ,ψ degrees of freedom: $\pm$ 100 mrad

Before low intensity beams are allowed to pass through QD0 for high precision beam-based alignment, the mechanical mover system will be required to bring QD0 into alignment with an

- Accuracy per x,y degree of freedom: $\pm$ 50 μm
- Accuracy per α,ϕ,ψ degree of freedom: $\pm$ 2.5 mrad

The QD0 mechanical alignment accuracy and stability after beam-based alignment and the QD0 vibration stability requirement are set by the capture range and response characteristics [8] of the inter-bunch feedback system.

- QD0 alignment accuracy: $\pm$ 200 nm and 5 μrad from a line determined by QF1s, stable over the 200ms time interval between bunch trains
- QD0 vibration stability: Δ(QD0(e+)-QD0(e-)) < 50 nm within 1ms long bunch train

We note that control of this mover system will remain under control of the BDS system during operation and that alignment of other parts of the detector with respect to the QD0 cryostats is an issue that may need careful consideration. The movers may be periodically adjusted during a run to keep luminosity at its maximum value.