

# Development of bearing monitor of muon target at J-PARC MLF

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The muon target at J-PARC MLF have been used rotating target to disperse radiation damage and heat load due to proton beam injection[1]. Rotating targets allow for a longer lifetime than fixed targets, but the lifetime of a rotating target is determined by the lifetime of the bearings in the rotating target. The lifetime of the bearing is mainly determined by the total number of revolutions, but it is further reduced if the bearings are operated under high loads due to faulty installation or abnormal operation. Therefore, there is a need to develop a system that monitors the condition of the bearings and predicts their lifetime. We confirmed FFT analysis of the resolver signal obtained from the motor-driver controlling the rotation speed of the target and found that the signal contained vibrations from bearings during beam on (fig.1). Furthermore, we found characteristic vibrations which occur on maintenance days during beam off. We report on the features and trends of the data by using the spectral centroid method and the basic statistics of the data. (fig.2).

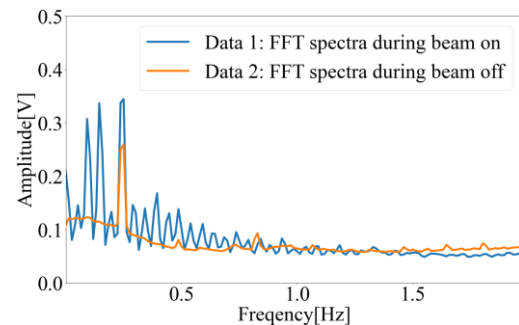


Fig. 1 FFT spectra on signal depends on temperature of rotating target.

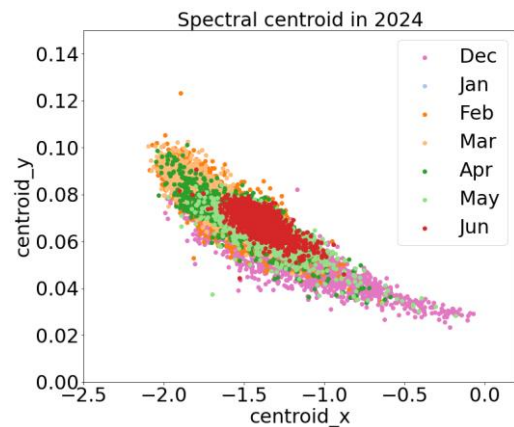


Fig. 2 Spectral centroid plot with FFT spectra on signal.

## References

[1]W. Higemoto, R. Kadono, N. Kawamura, et al., Quantum Beam Sci. 1, 11, (2017).