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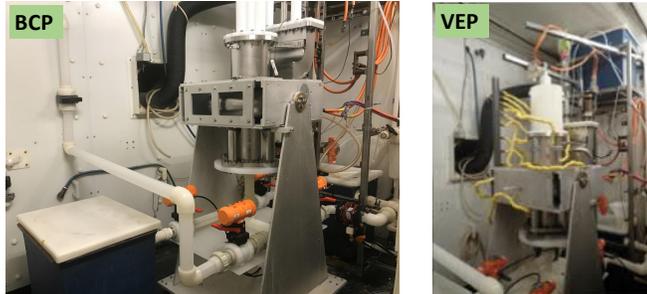
## Abstract

Cornell SRF group is working on rebuild the cryomodule (CRYO-2 BB1-5) as the spared cryomodule for the CESR operation. To minimize BCS surface resistance and achieve high quality-factor ( $Q_0$ ), we treated the 500MHz B-cell SRF cavity by 2/6 N-doping recipe. In this work, we report the SRF performance of the B-cell with detailed surface resistance de-component vs. magnetic fields as well as high-gradient achievement in the first time.

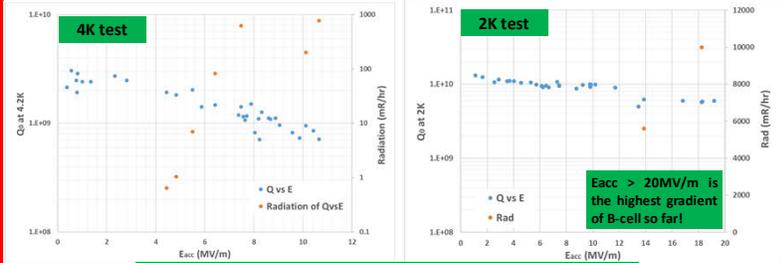
### Cavity treatment recipe:

1. BCP 32um, then HPR;
2. 1st Bulk EP 57um;
3. 2nd Bulk EP 47um, then HPR;
4. N-doping (2/6 recipe);
5. 1st light EP 2.5um on the cavity;
6. 2nd light EP 2.5um on the cavity.
7. HPR and assembly.

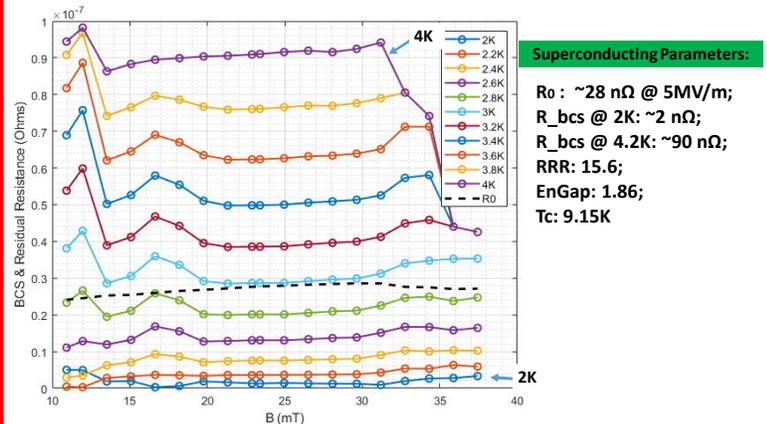
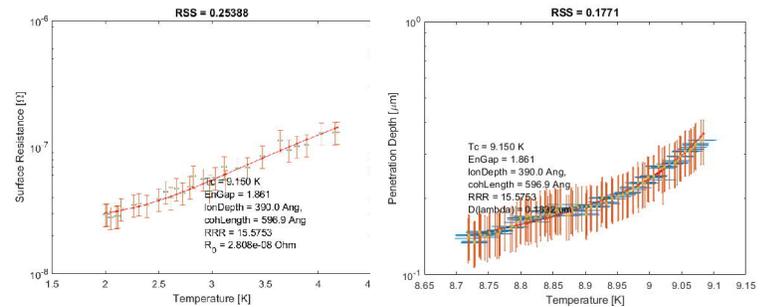
### B-cell surface preparation:



### VT test results and analysis



Eacc in 2K and 4K tests was limited by RF power, but not quench!



## Conclusion

The Cornell B-cell has been successfully treated by 2/6 N-doping recipe and cryogenic tested. The detailed RF performance of such cavity has been shown in the first time: the cavity gradient achieved above 20MV/m without quench, which is twice time high of the specification; the BCS resistance of 2K and 4K reached  $\sim 2$  n $\Omega$  and  $\sim 90$  n $\Omega$  respectively, which is lower than a clean surface (un-doped case).