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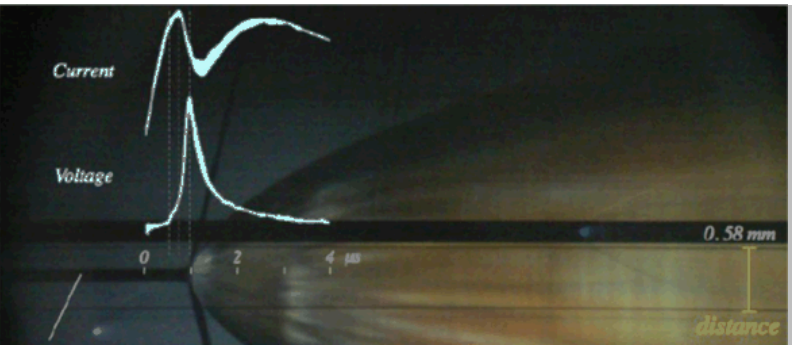

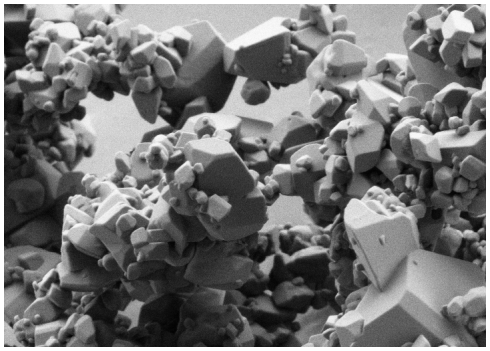

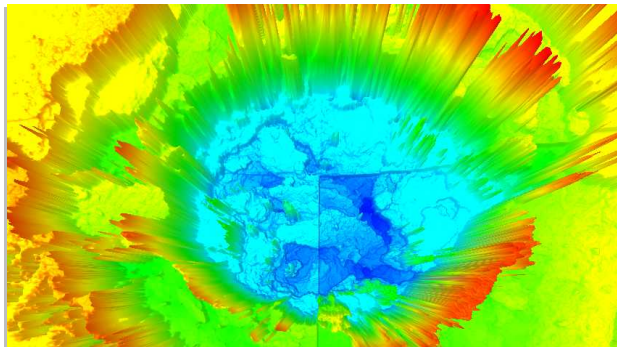

Electrical Comparison of Ignition Versus Initiation

C. J. Valancius, J. Bainbridge, C.W Love, D. R. Richardson

cjvalan@sandia.gov

Sandia National Laboratories

New Mexico, USA

U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

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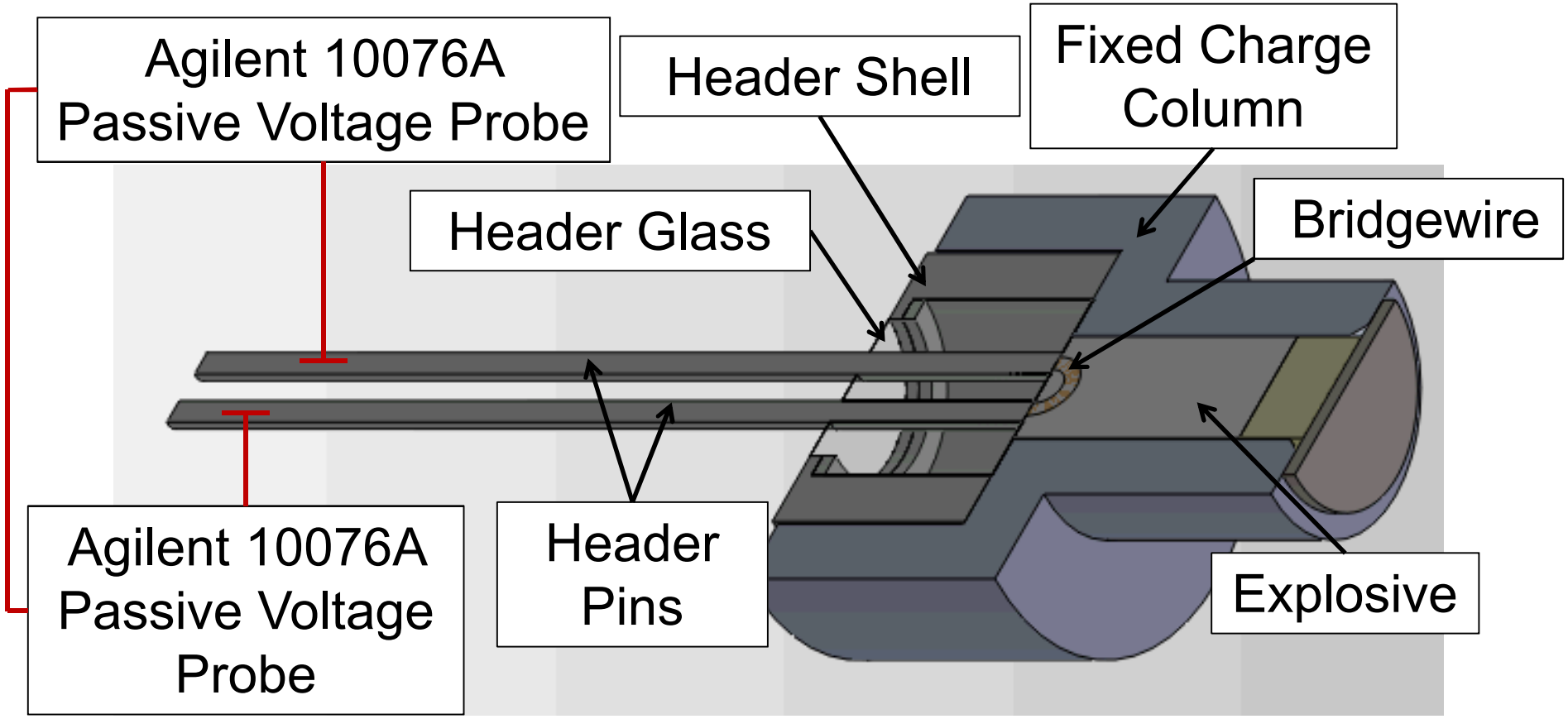
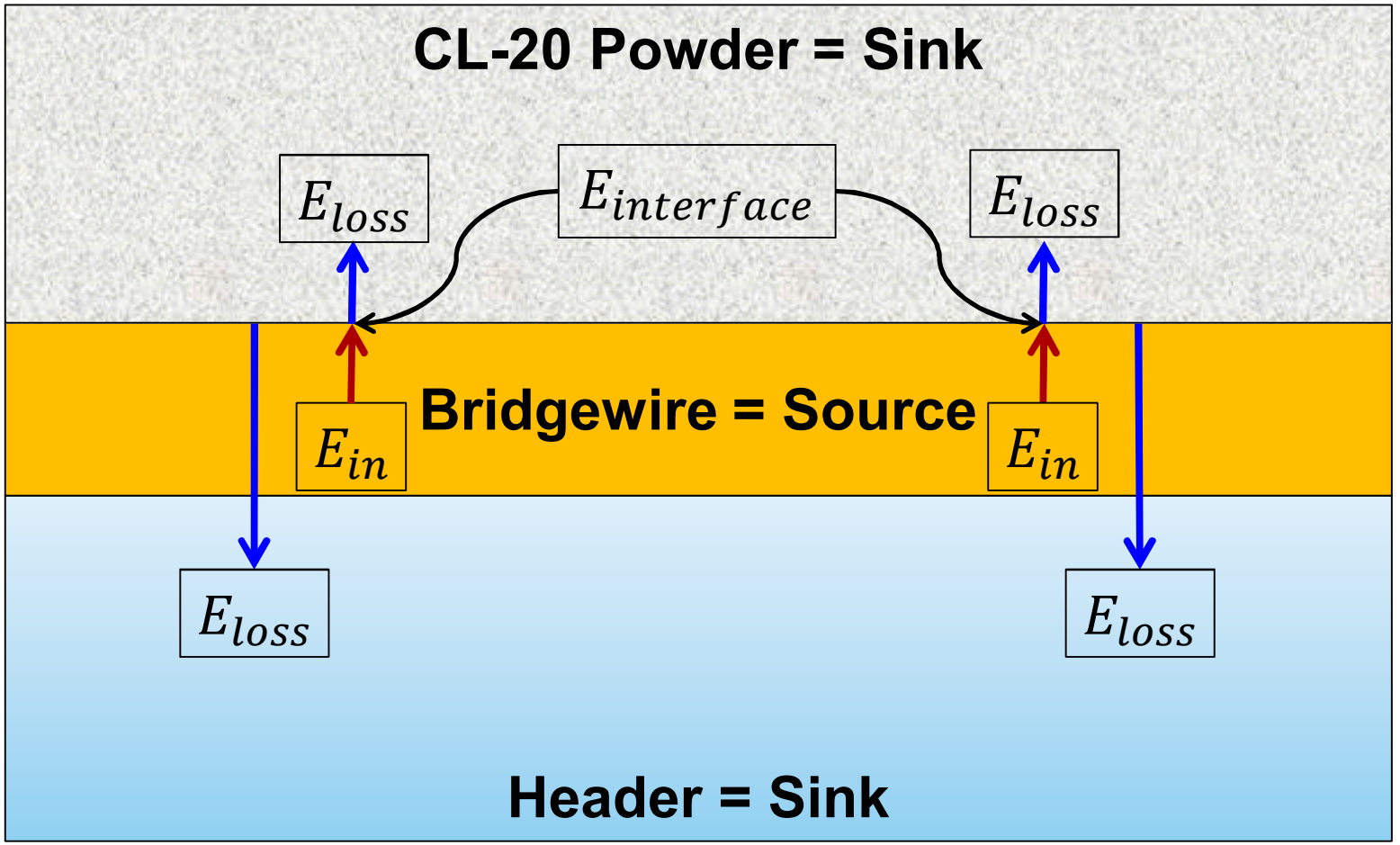
The Test Vehicle

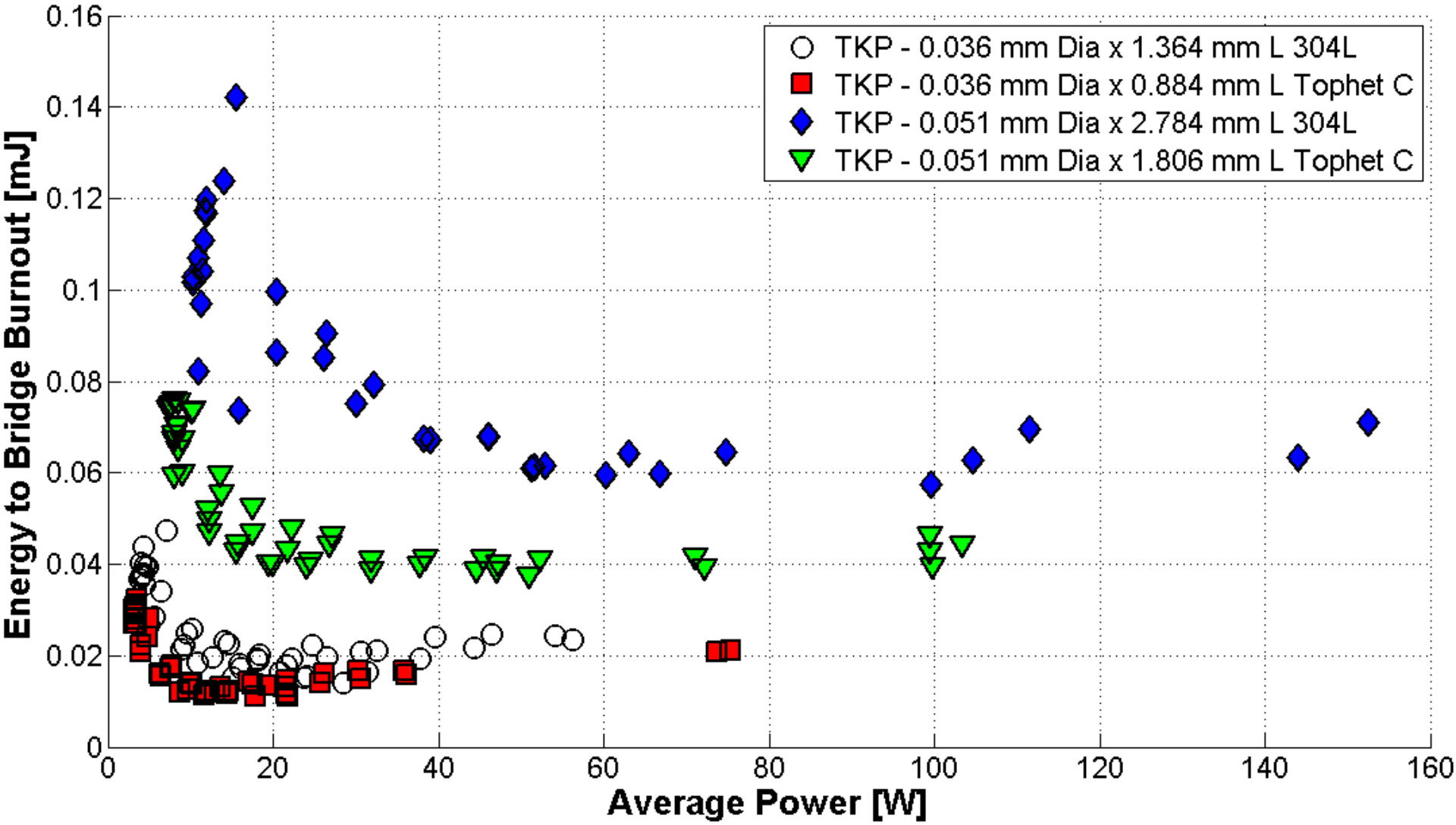


The Ignition Problem

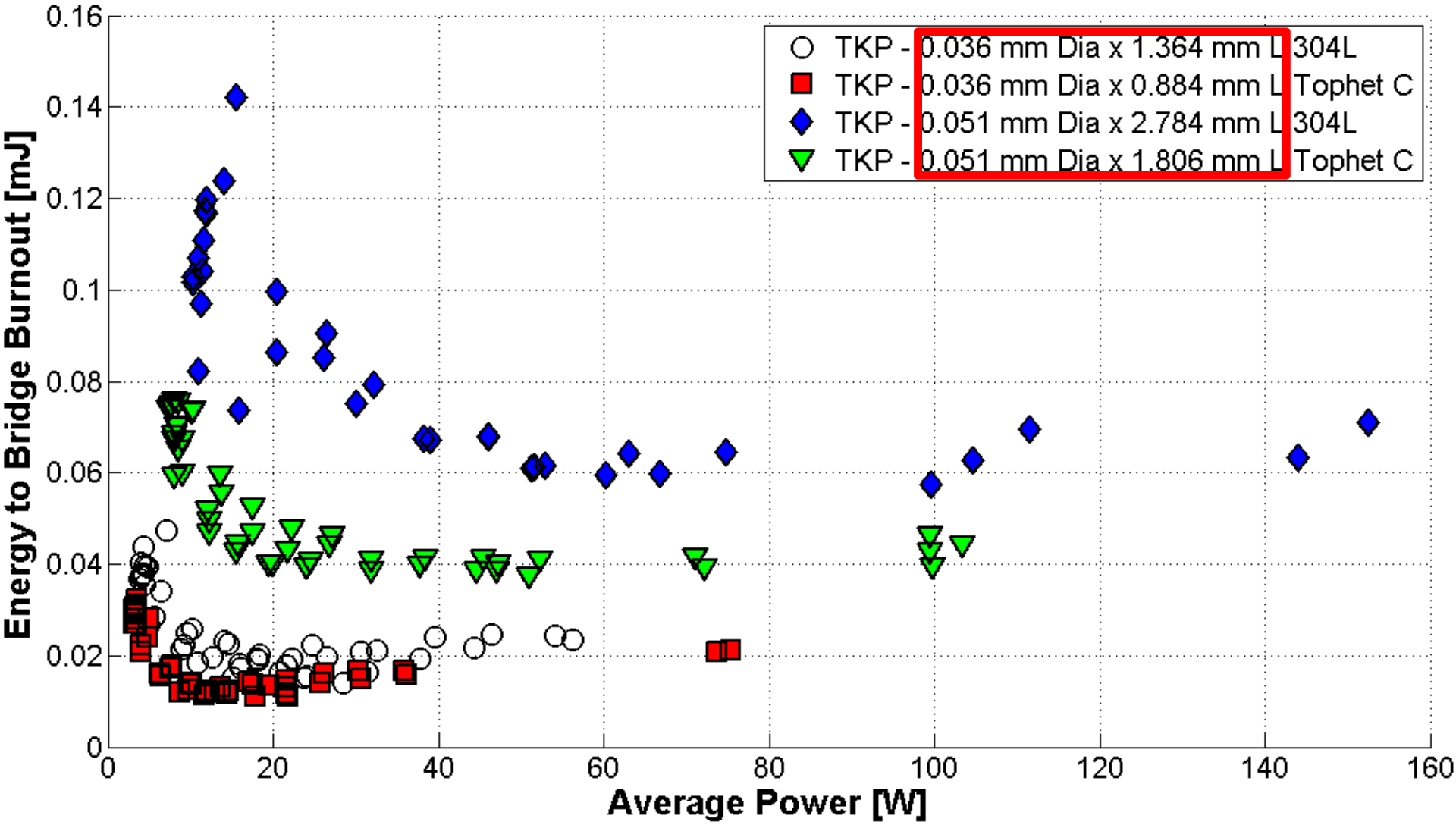


- Trying to find $E_{input} - E_{loss} \geq E_{ignition}$

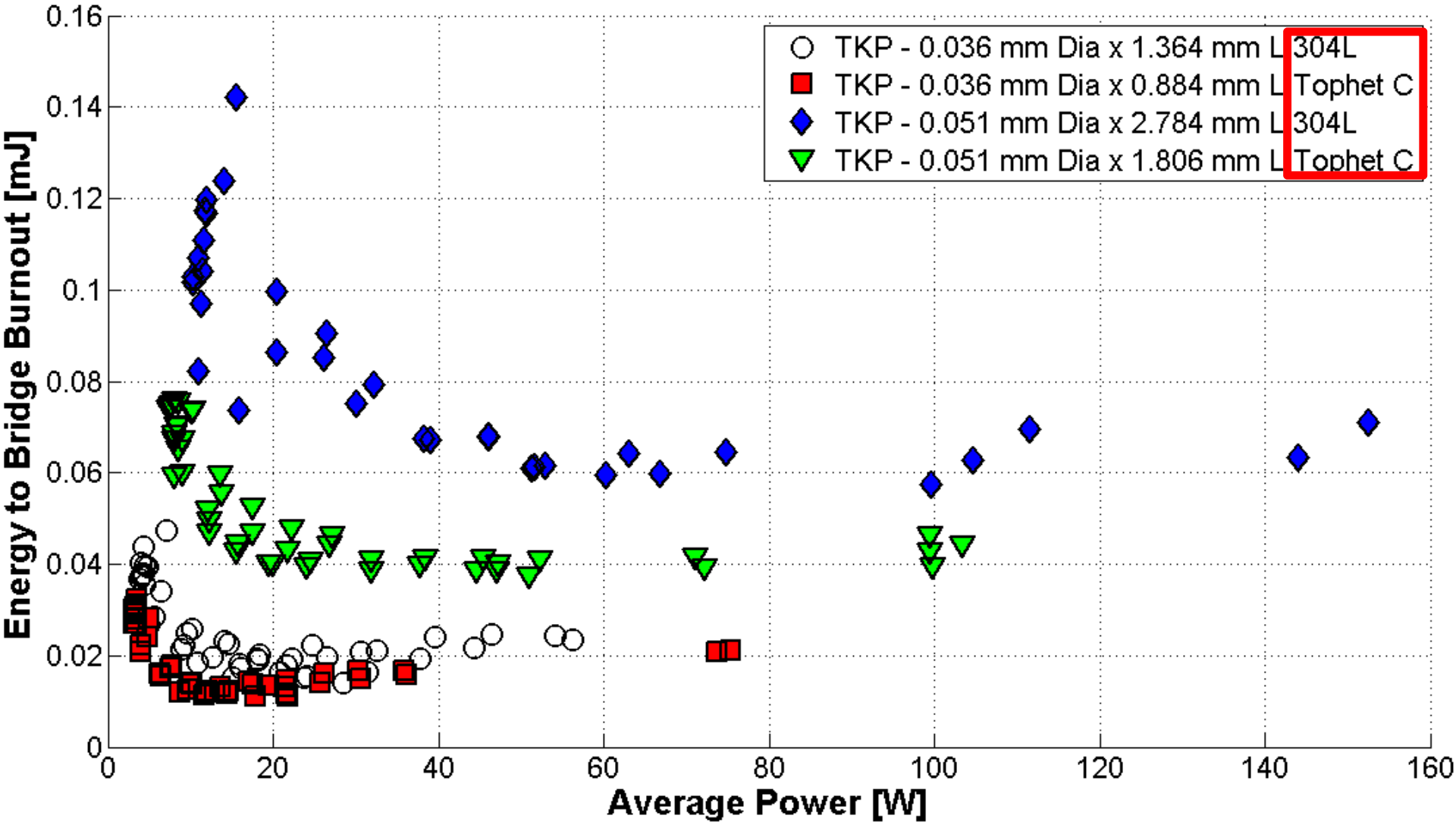
Ignition Criteria from TKP Tests



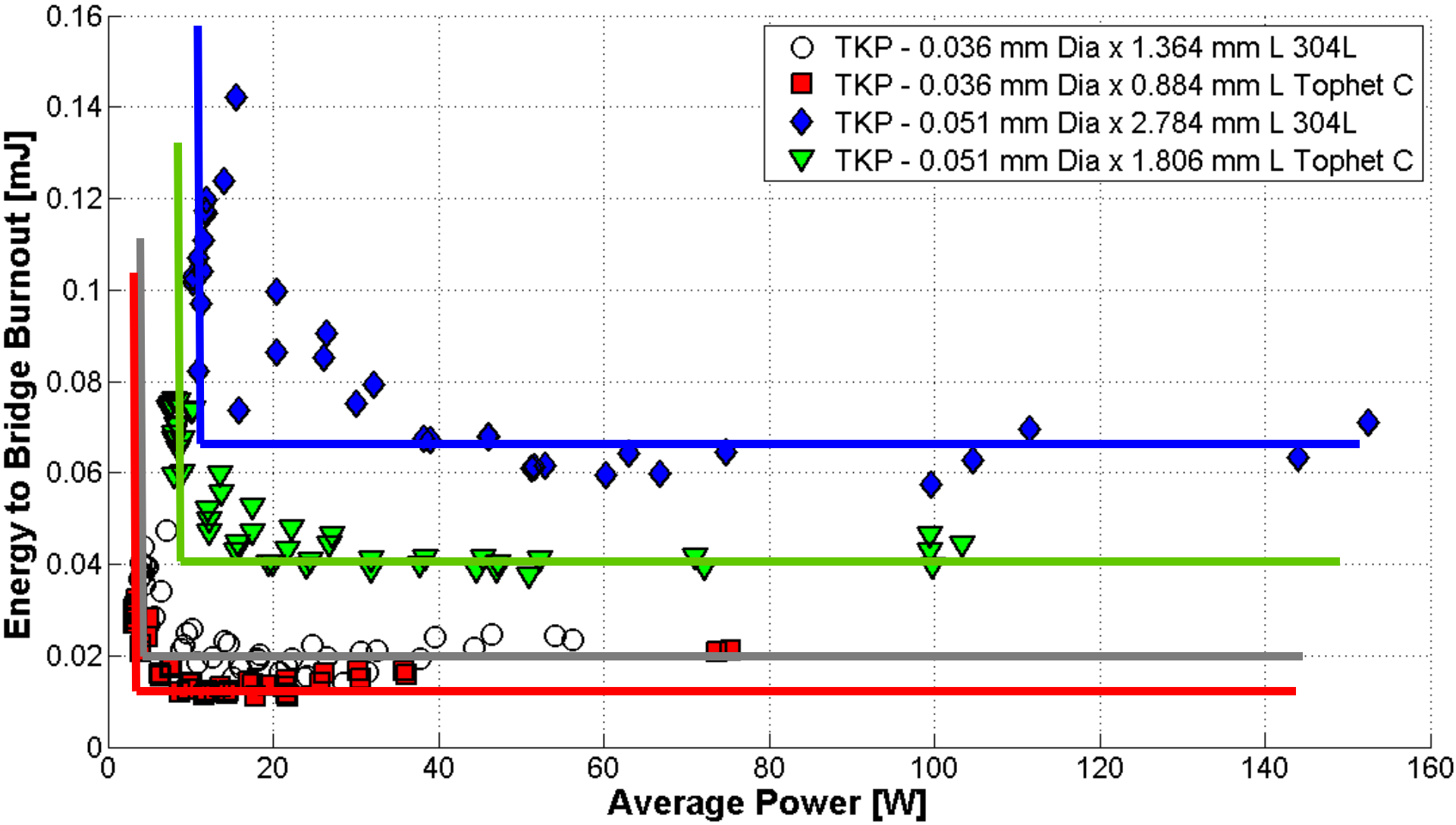
Different Sizes



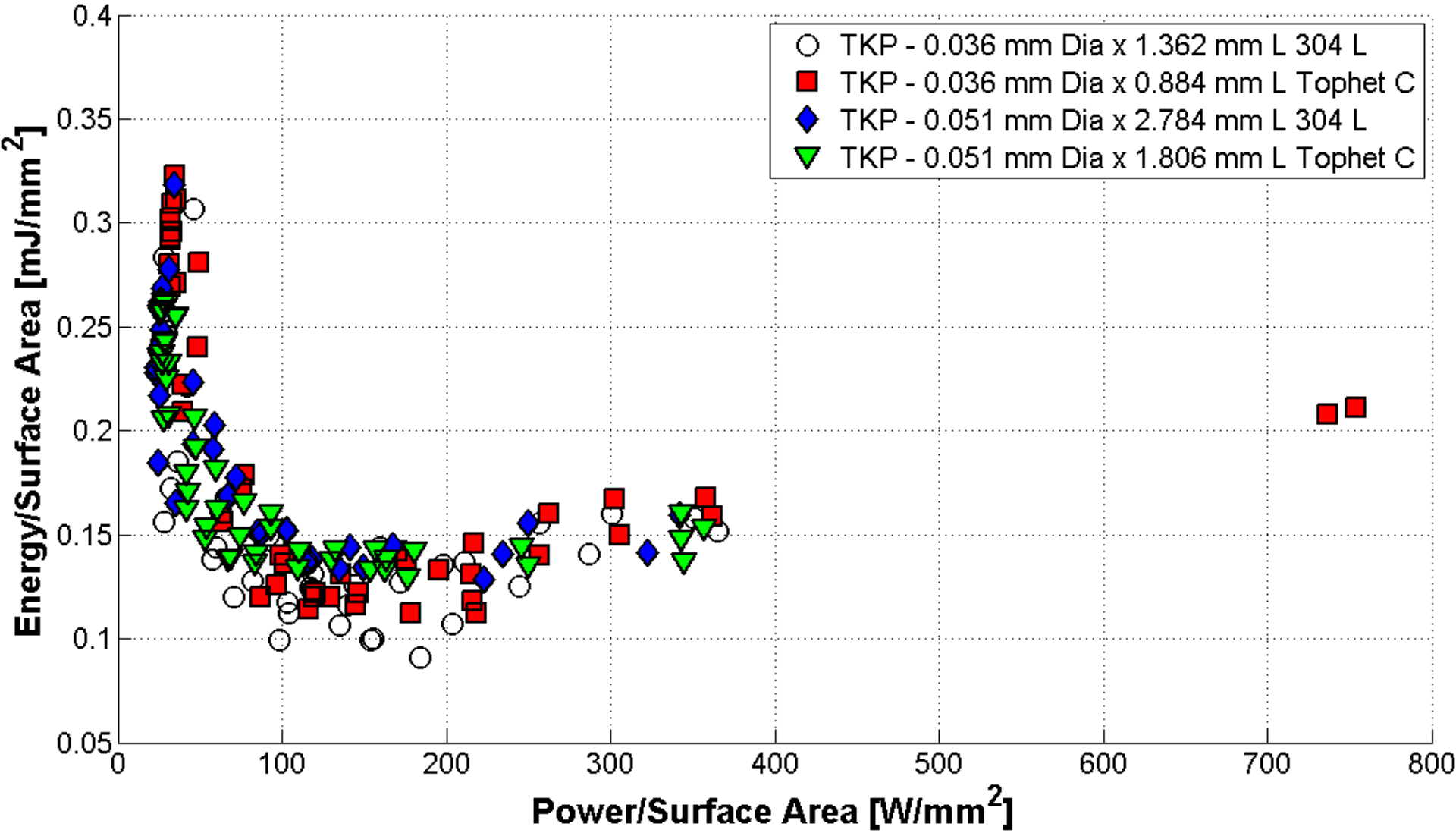
Different Materials



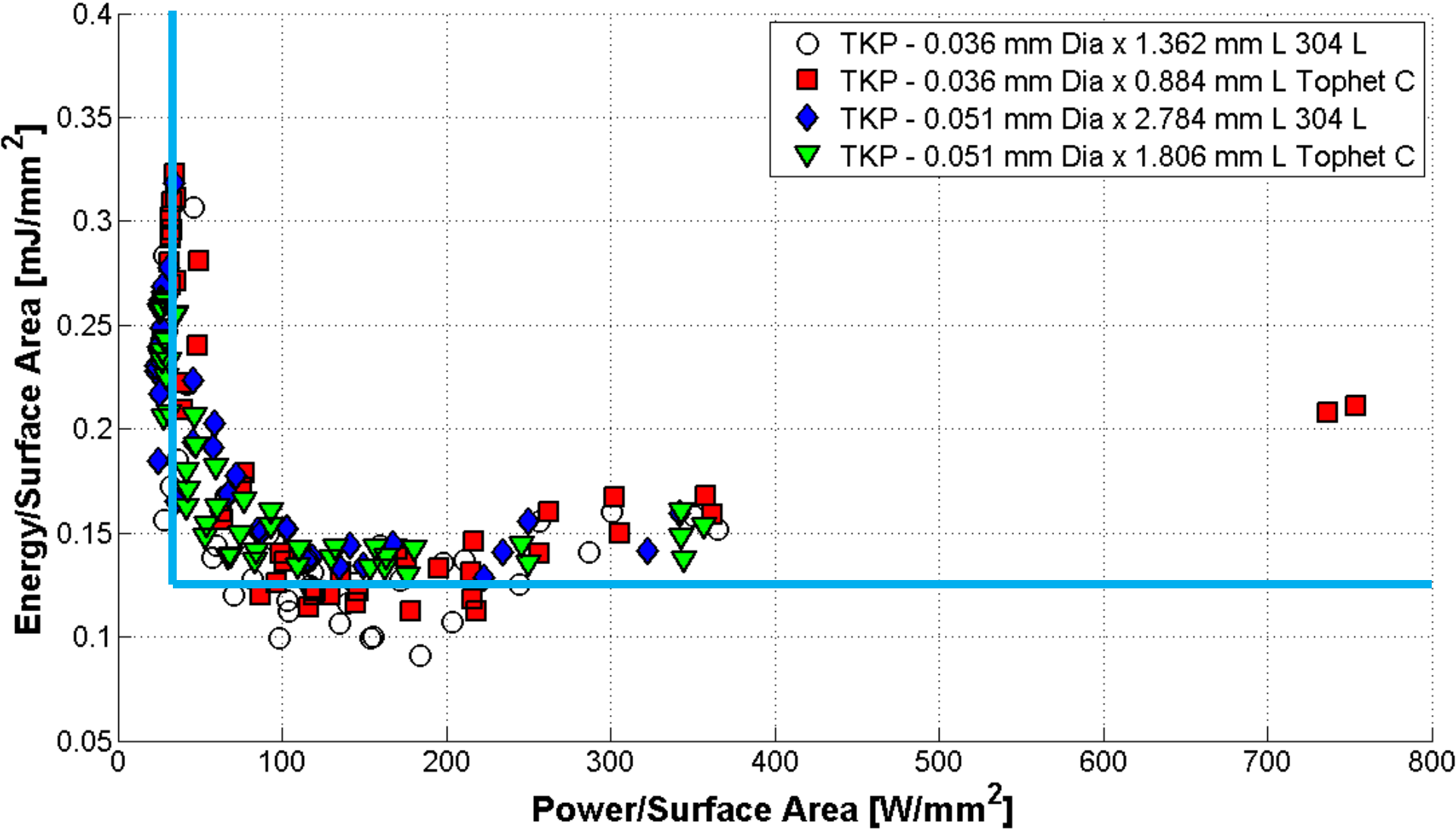
Different Asymptotes



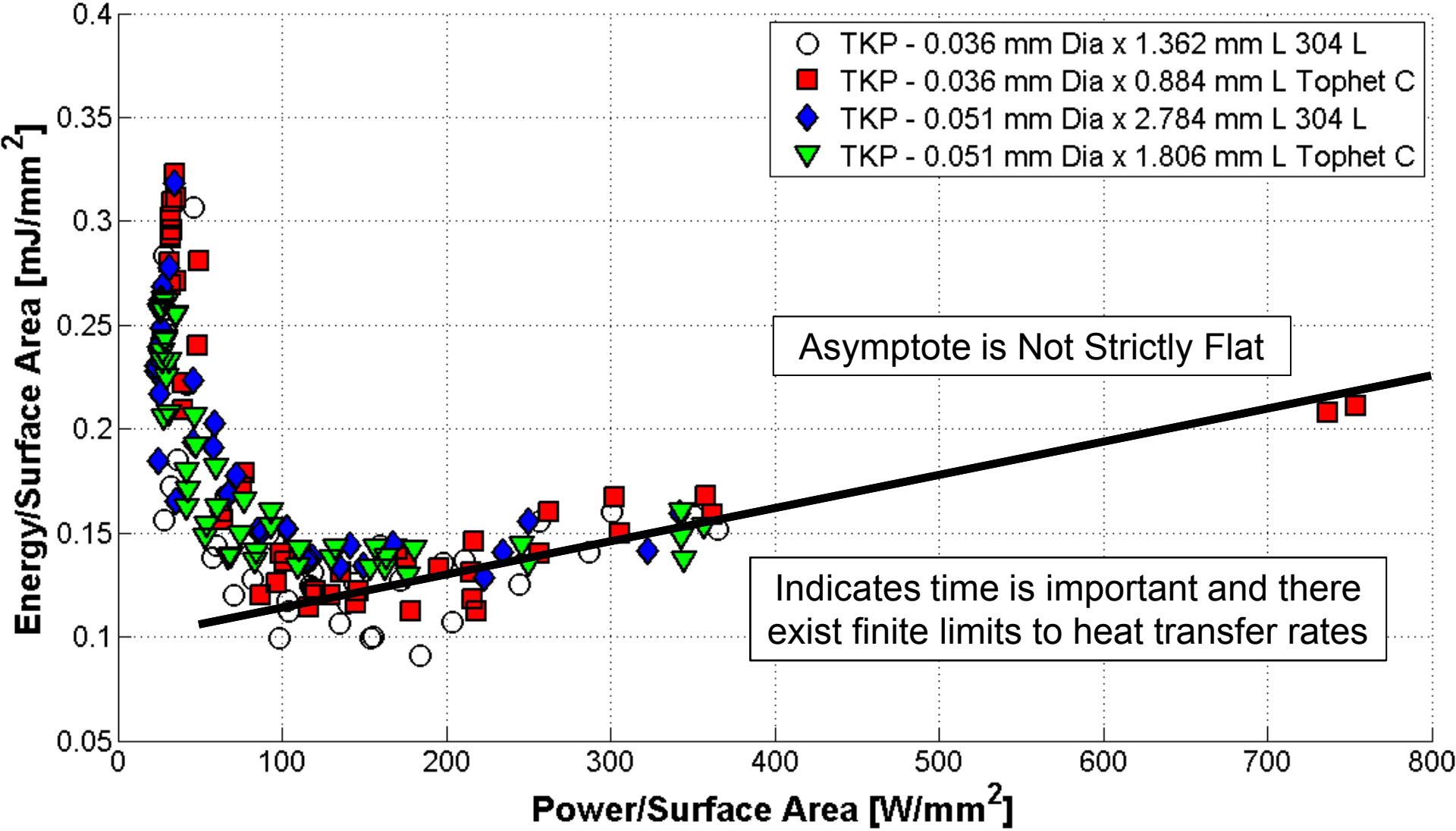
Normalized by Surface Area



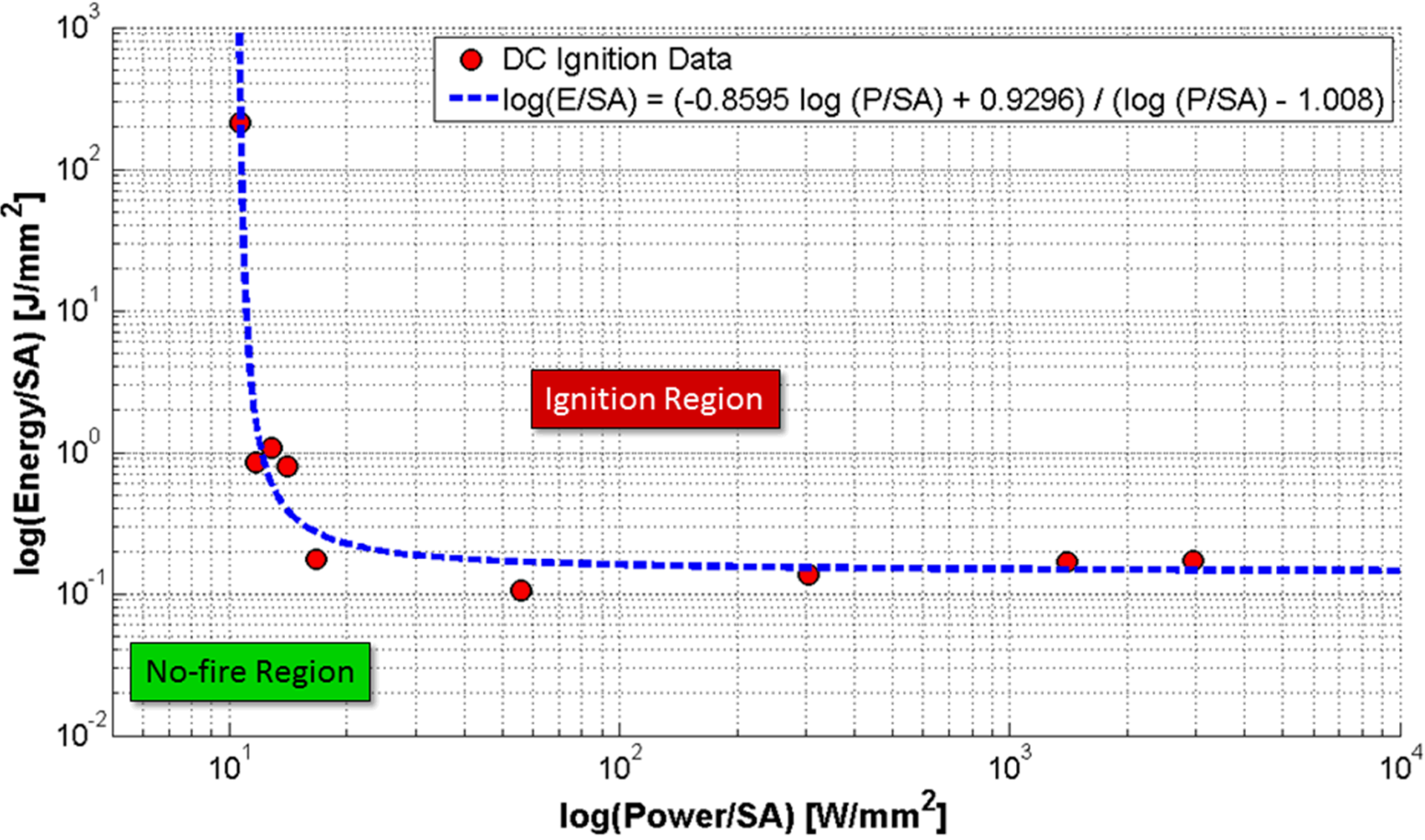
Same Asymptotes – Test One, Results for All



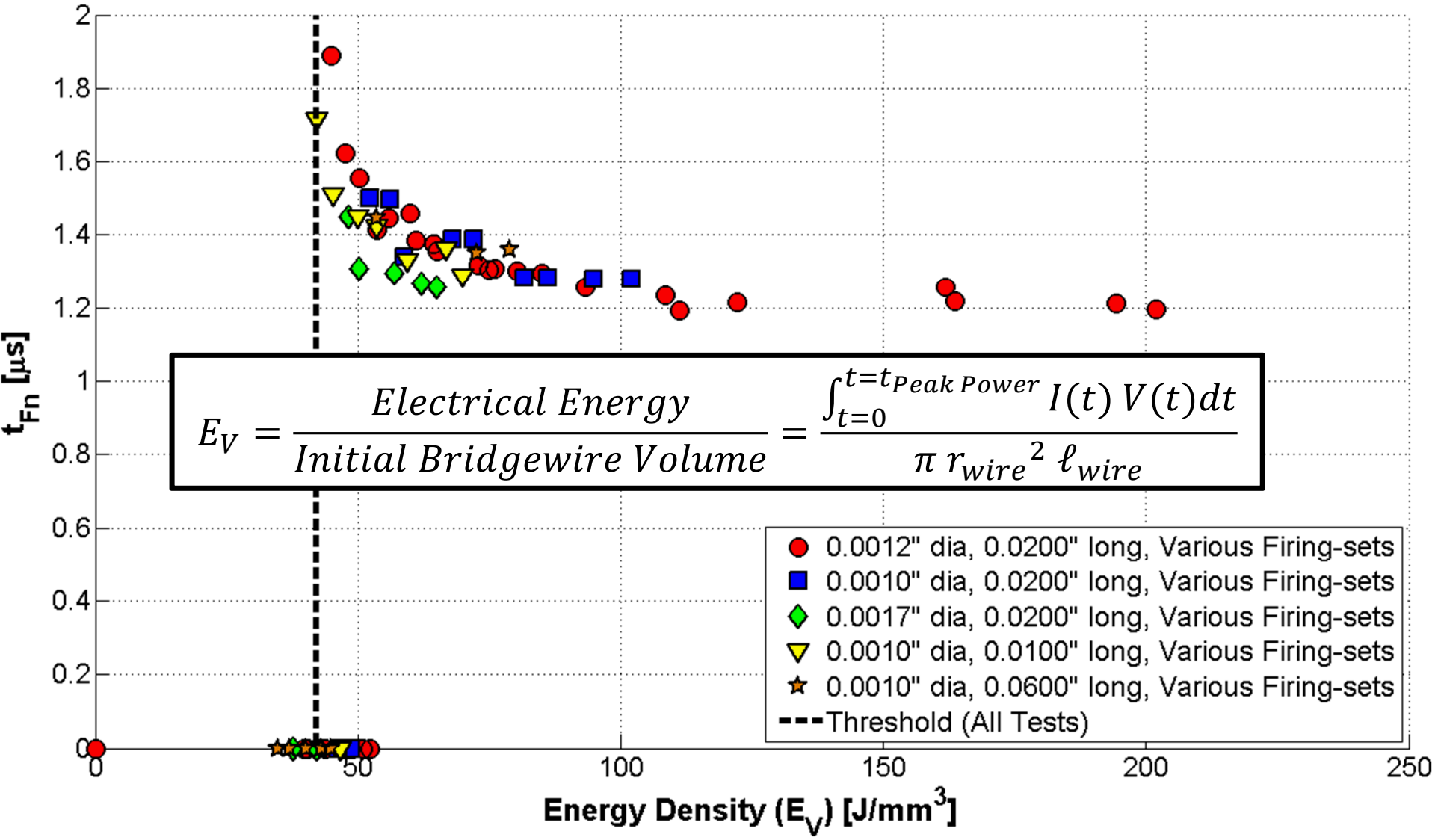
One Important Note for Later



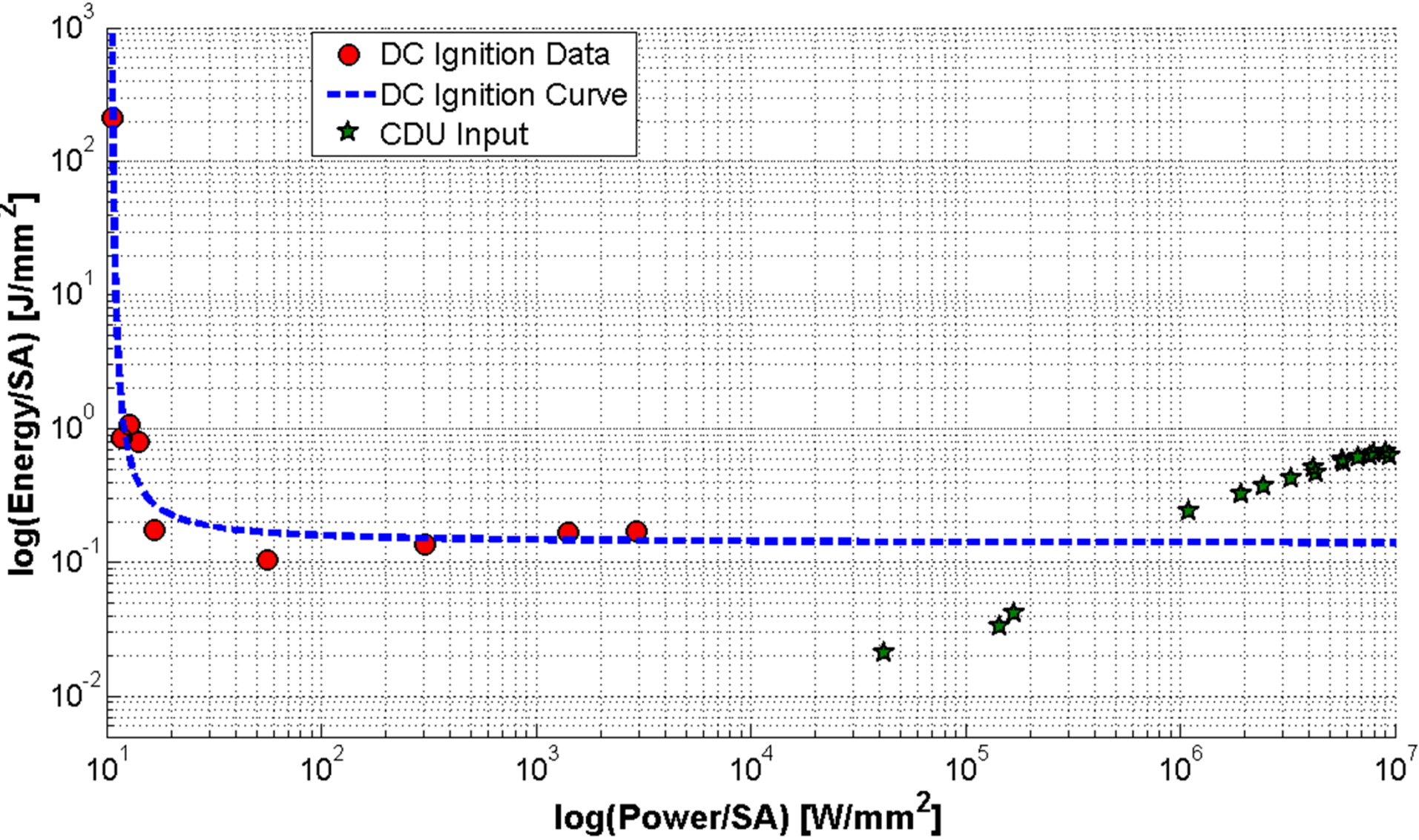
Ignition in an EBW Detonator



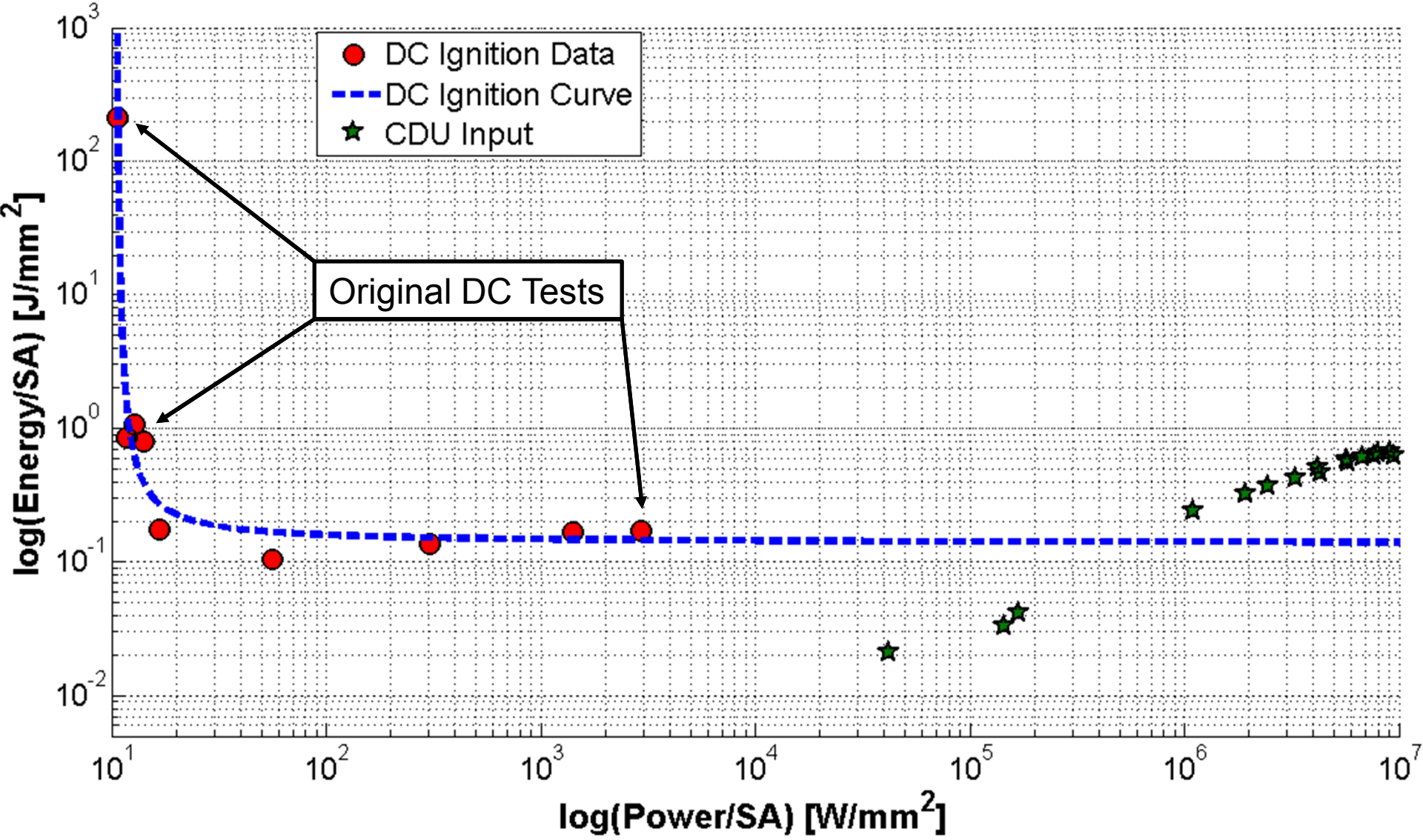
Initiation Criteria for EBW Detonators



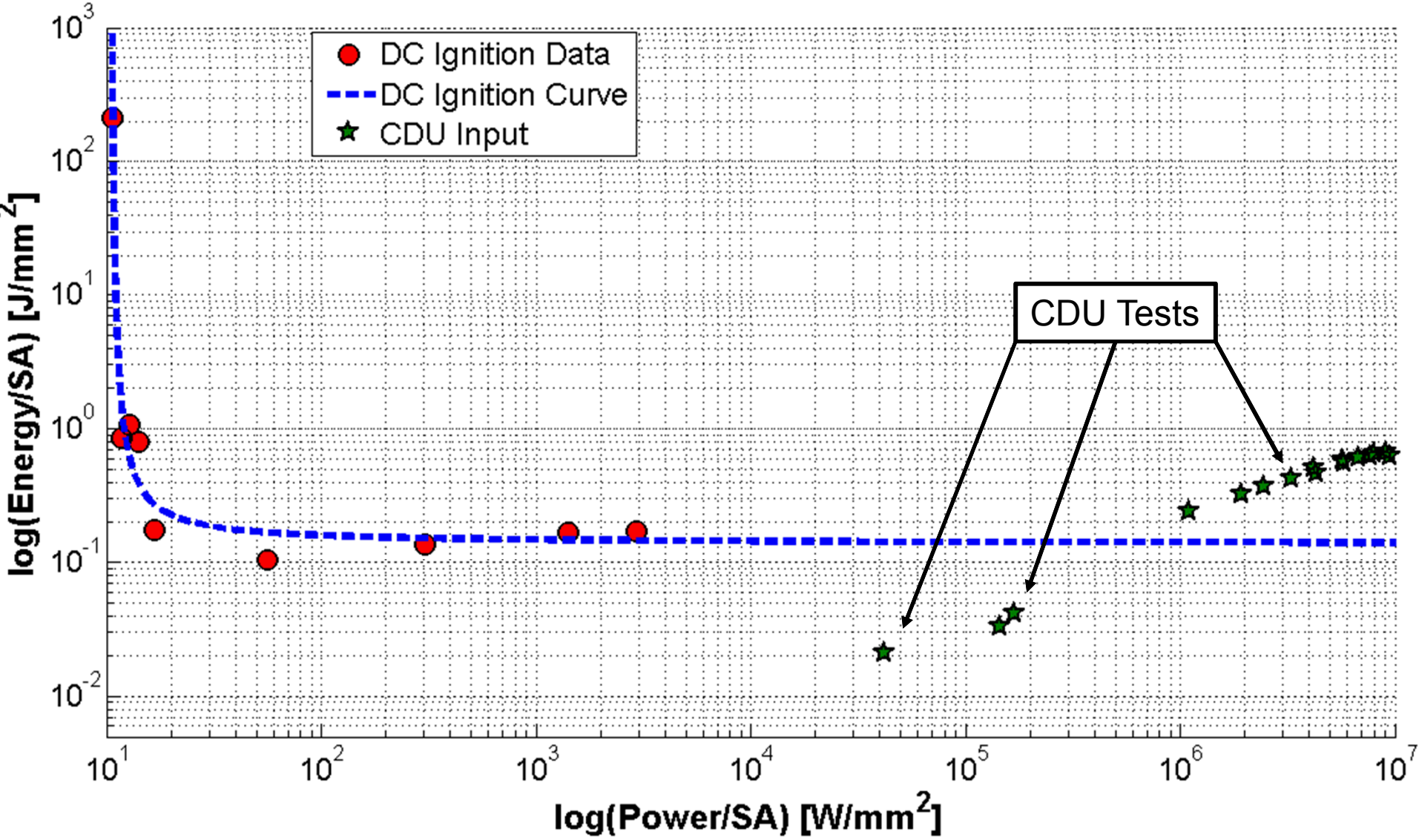
Mapping Initiation onto Ignition



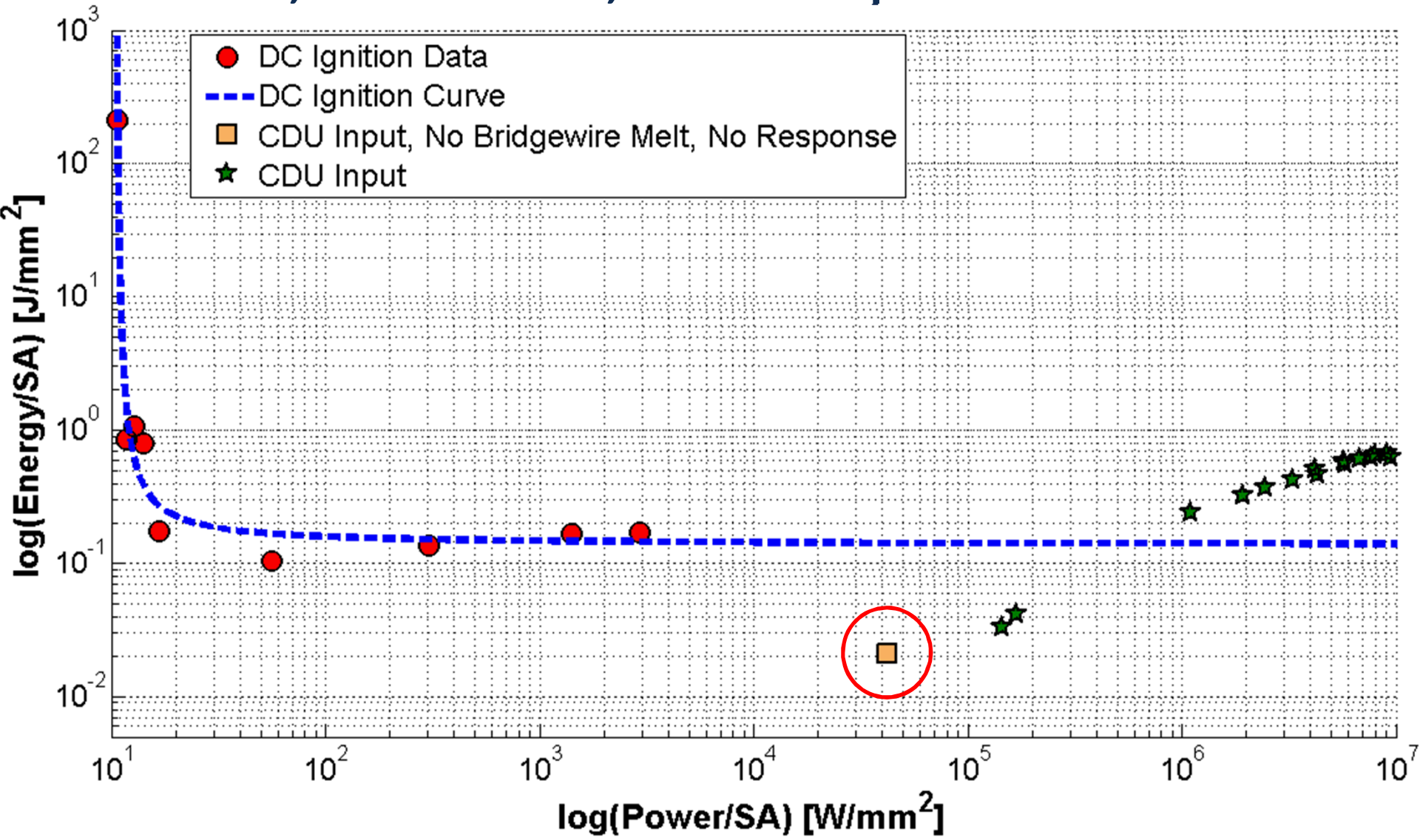
Mapping Initiation onto Ignition



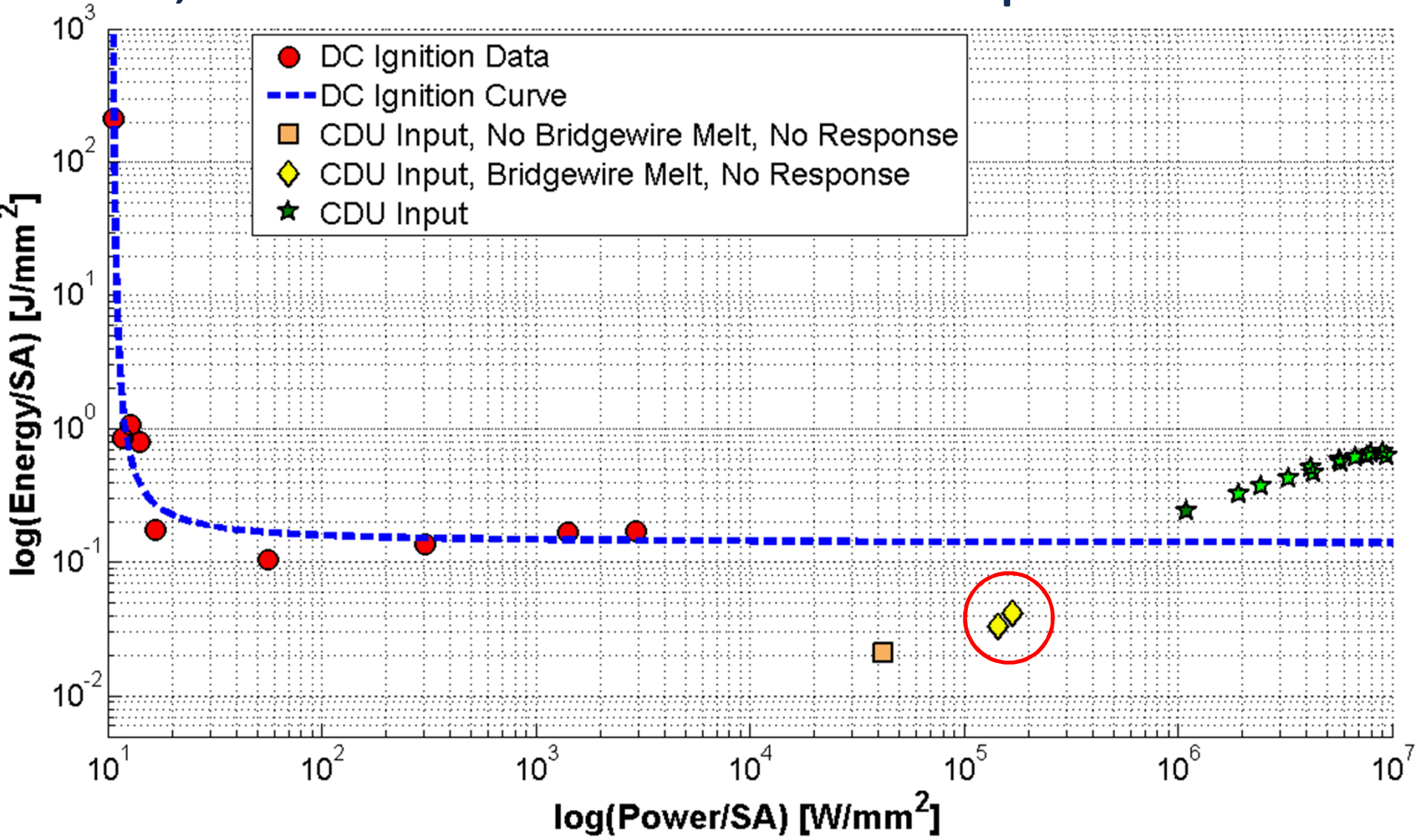
Mapping Initiation onto Ignition



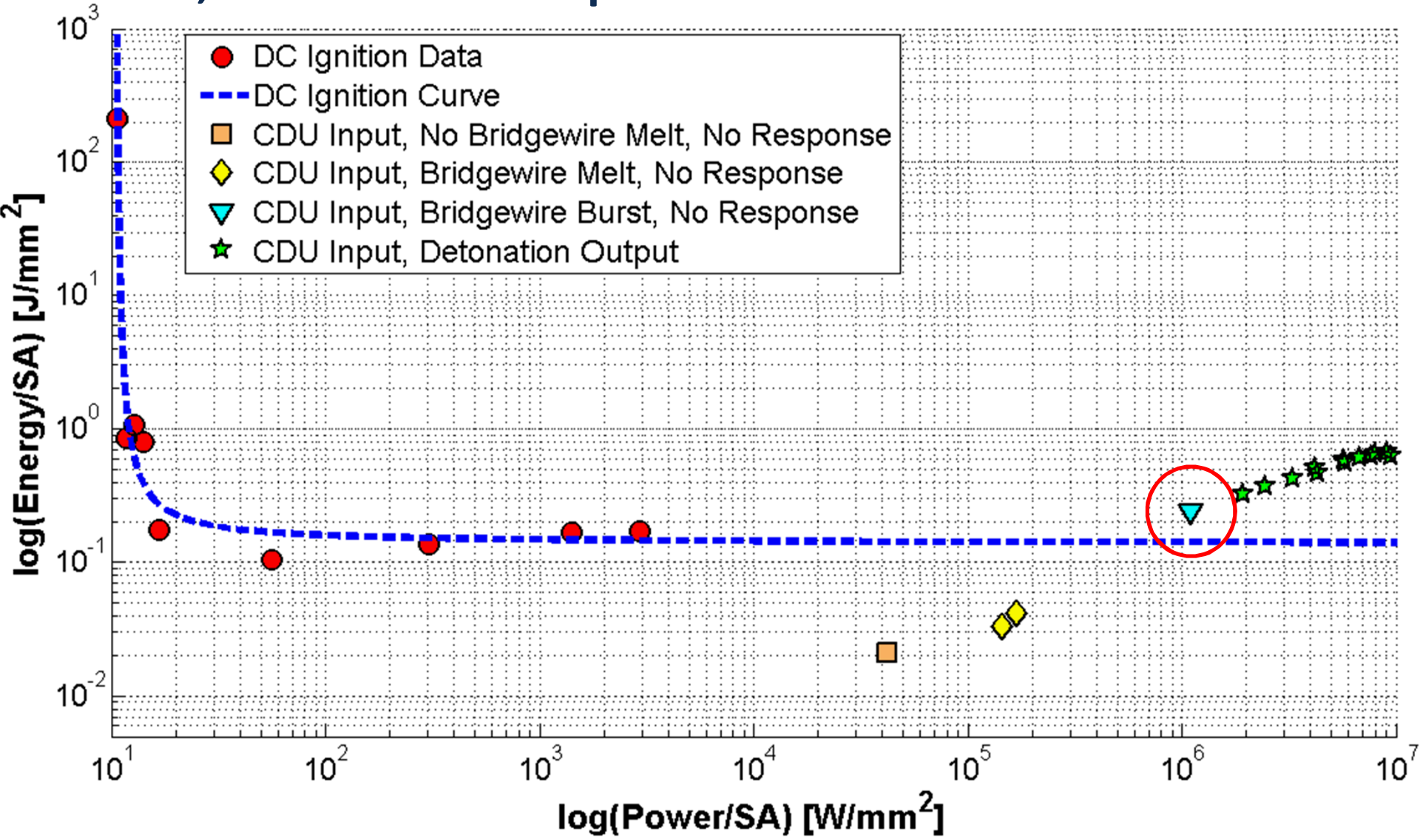
No Melt, No Burst, No Response



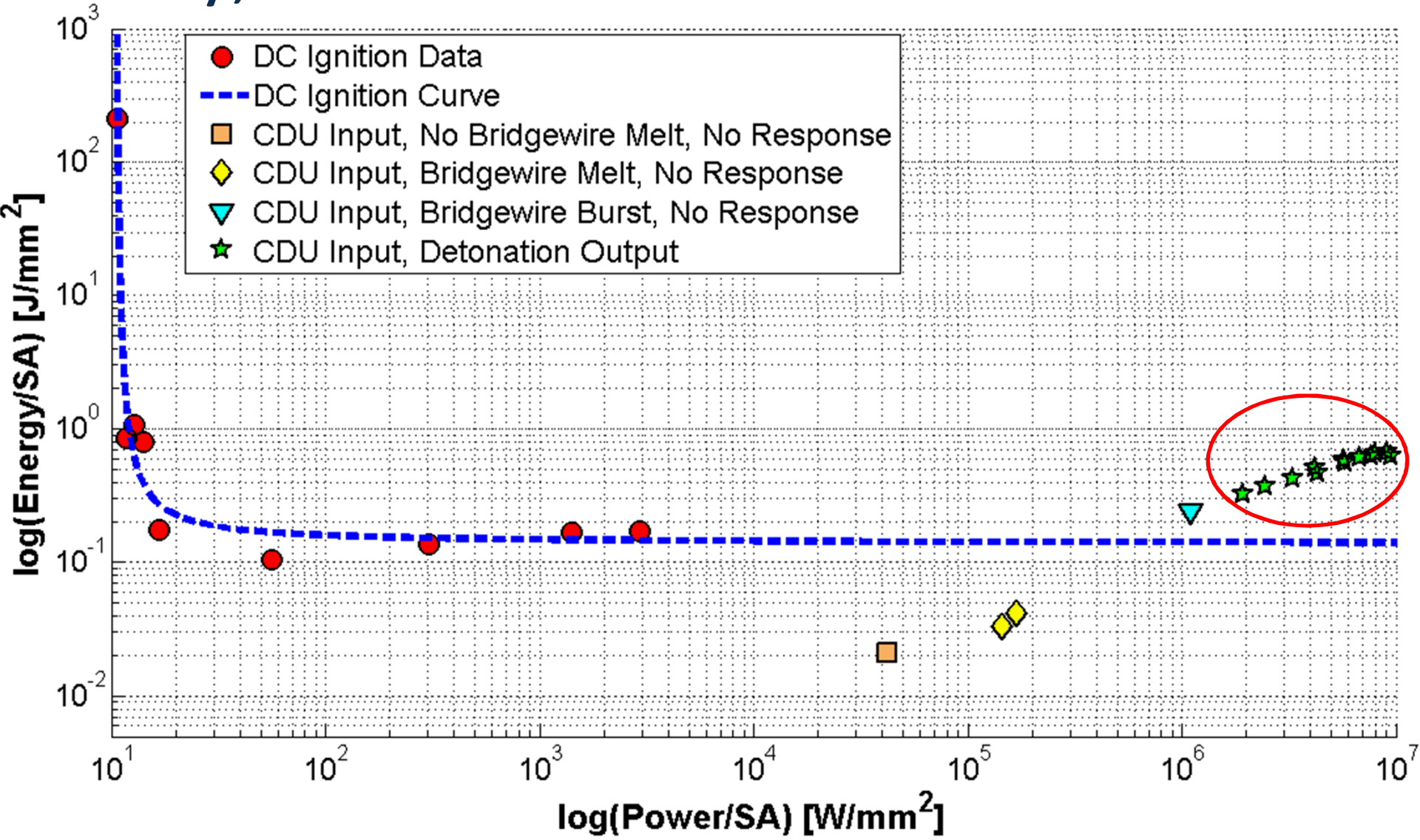
Melt, but No Burst and No Response



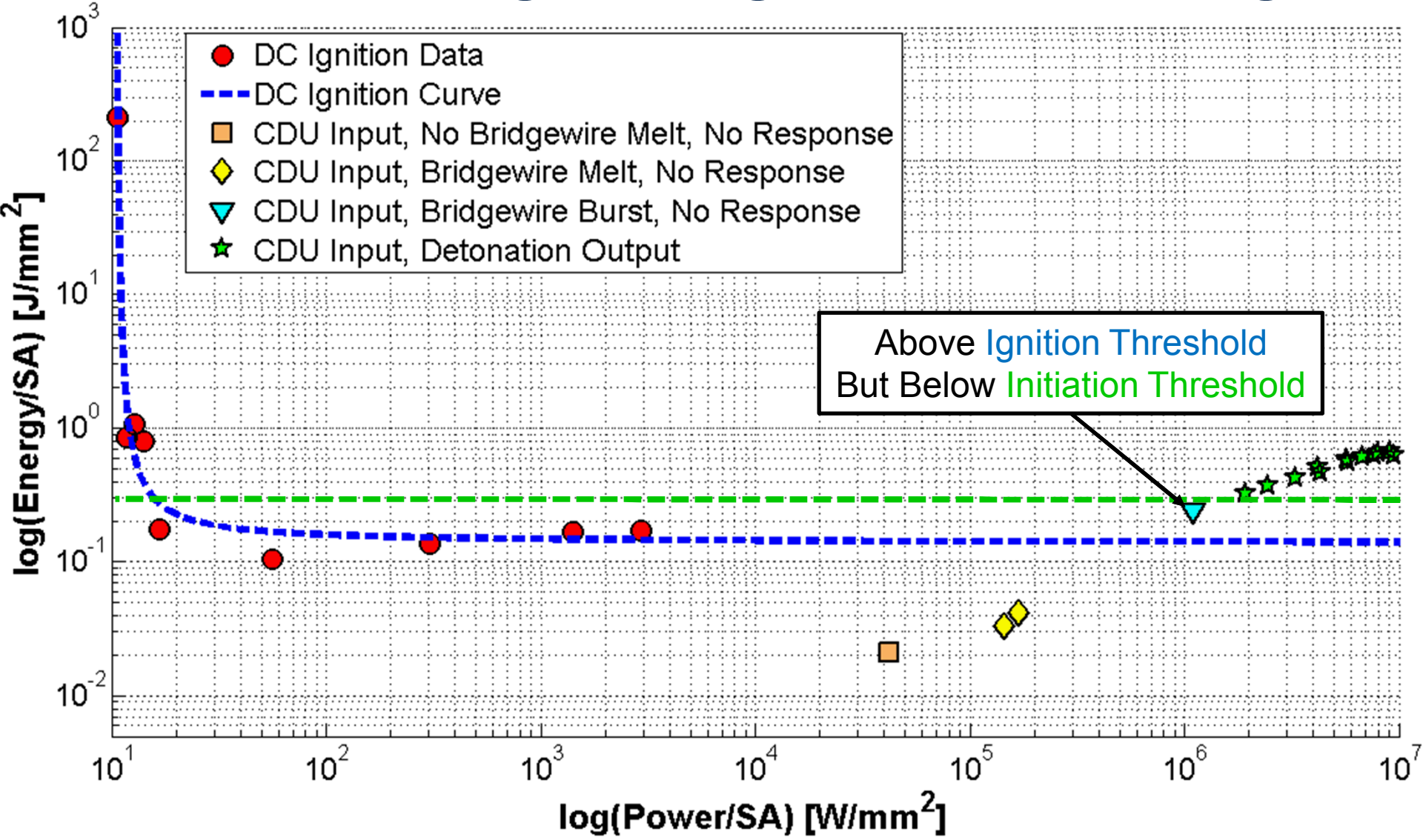
Burst, but No Response



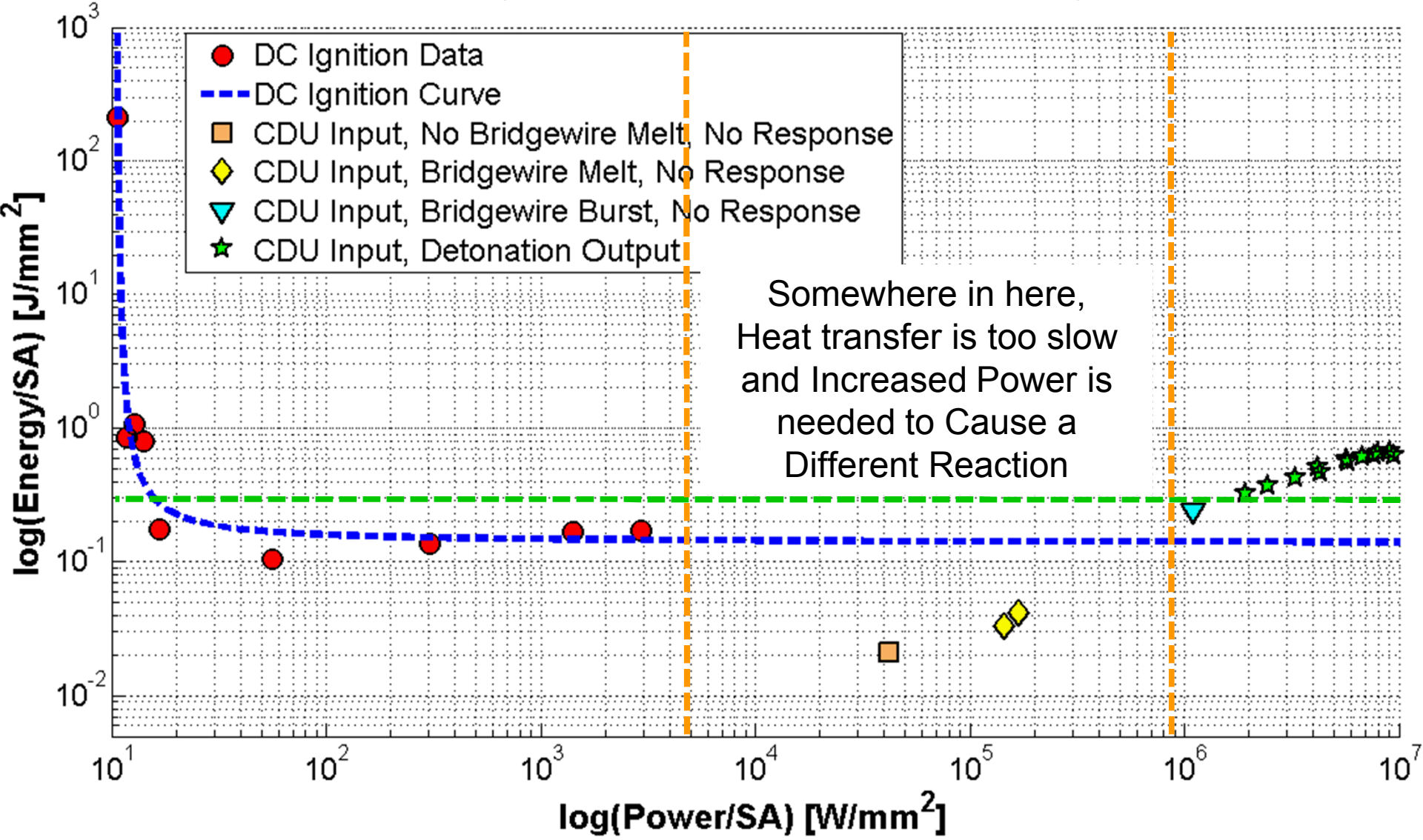
Finally, Detonation



More Then Enough E to Ignite…but Nothing…



It Seems Power (and therefore Time) Matter



Conclusions

- Igniting an EBW and initiating an EBW are two very different events.
- Ignition requires large amounts of time for heat transfer to occur.
- Initiation requires high power and small amounts of time to cause a reaction on a different time scale.
- This data suggests ignition does not occur in normal EBW operation.
- This data suggests ignition has nothing to do with detonation.

Acknowledgements

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