Lengthing LAr1-ND: ν_e Appearance

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LAr1-ND Meeting 4/22/2014

*Joseph's talk is the precursor to this talk

Question: What is the effect on the ν_e appearance sensitivity if we double LAr1-ND?

LAr1-ND

	Active	Fiducial	Cut
x (cm)	400	366	17
y (cm)	400	366	17
z (cm)	365	248	17 up, 100 down
Mass (t)	82	47	57%

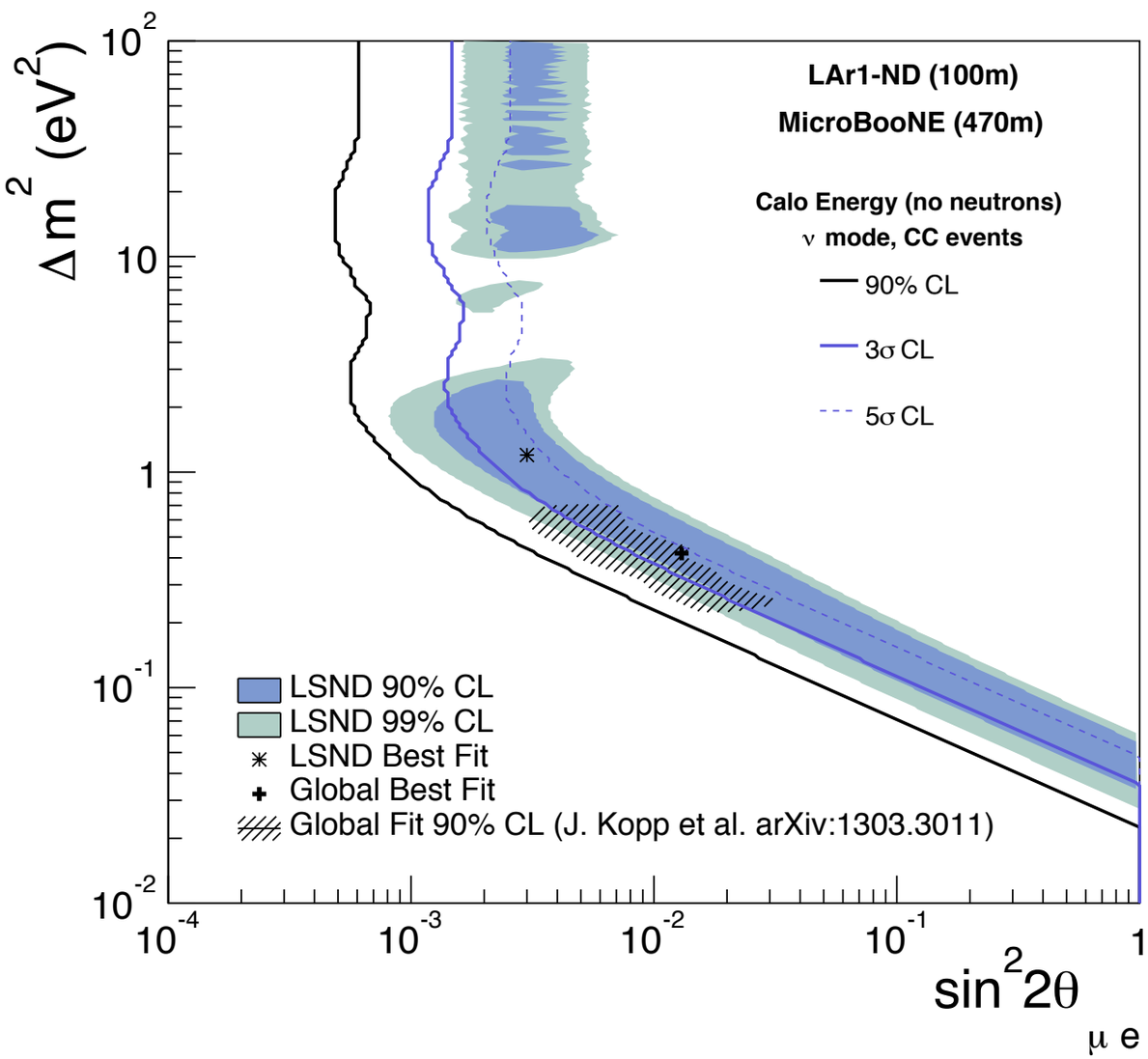
2*LAr1-ND

	Active	Fiducial	Cut
x (cm)	400	366	17
y (cm)	400	366	17
z (cm)	730	613	17 up, 100 down
Mass (t)	164	115	70%

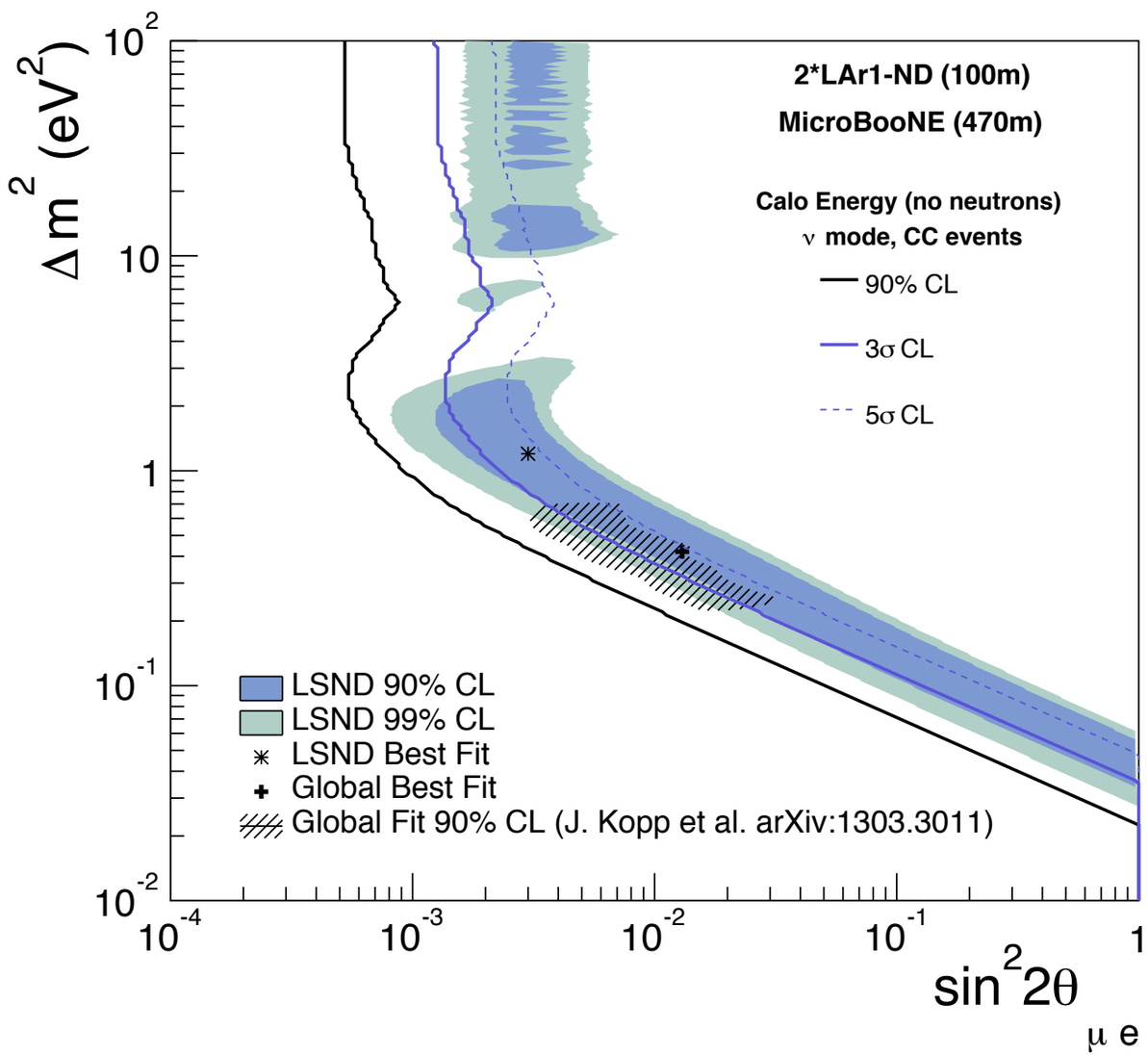
Fiducial cuts are based on old studies for shower containment.
I've just started a study of shower containment to verify the fiducial volume numbers.
Expectation is that electron energy will affect containment.

ND + uBoone

LAr1-ND

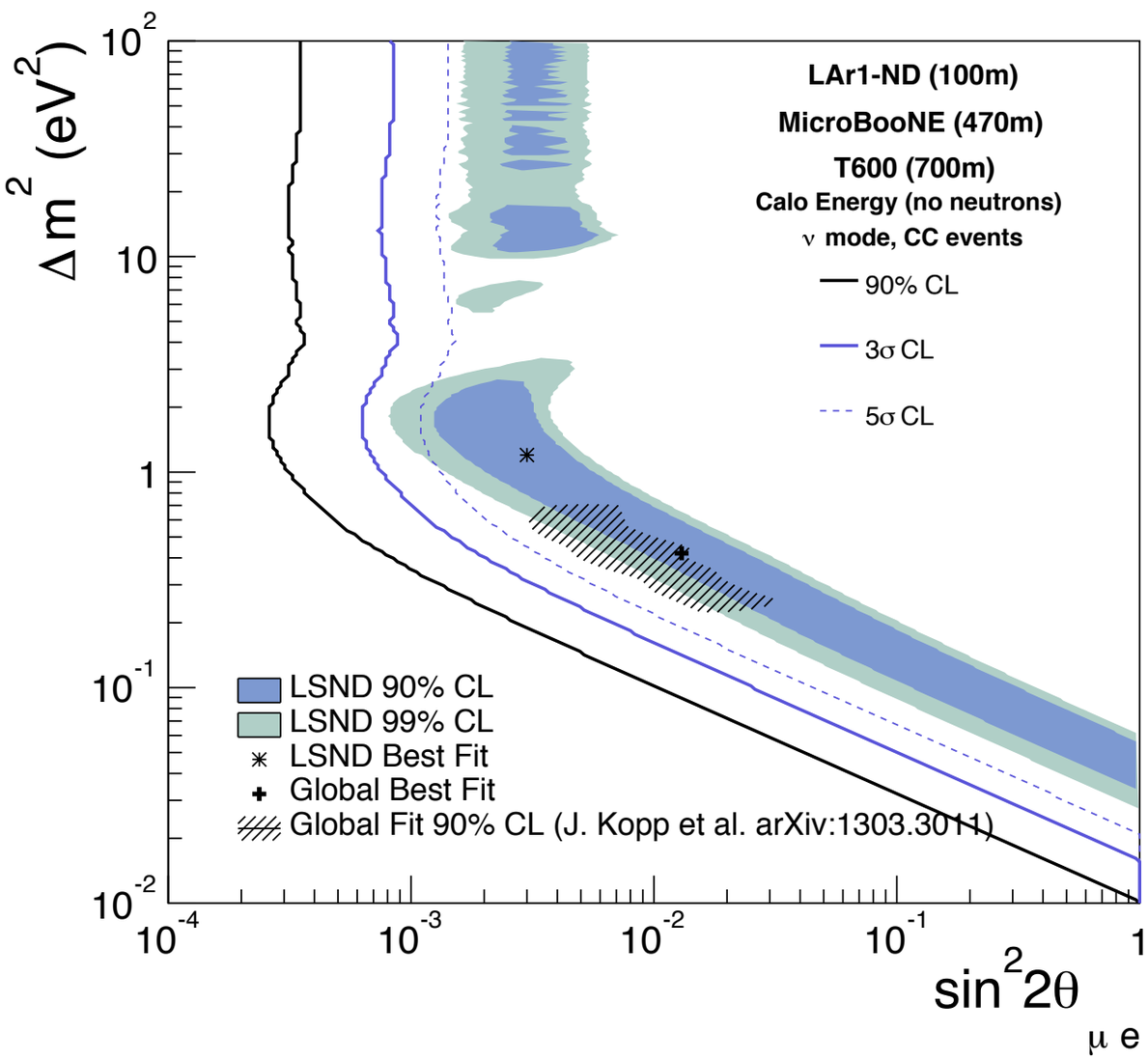


2*LAr1-ND

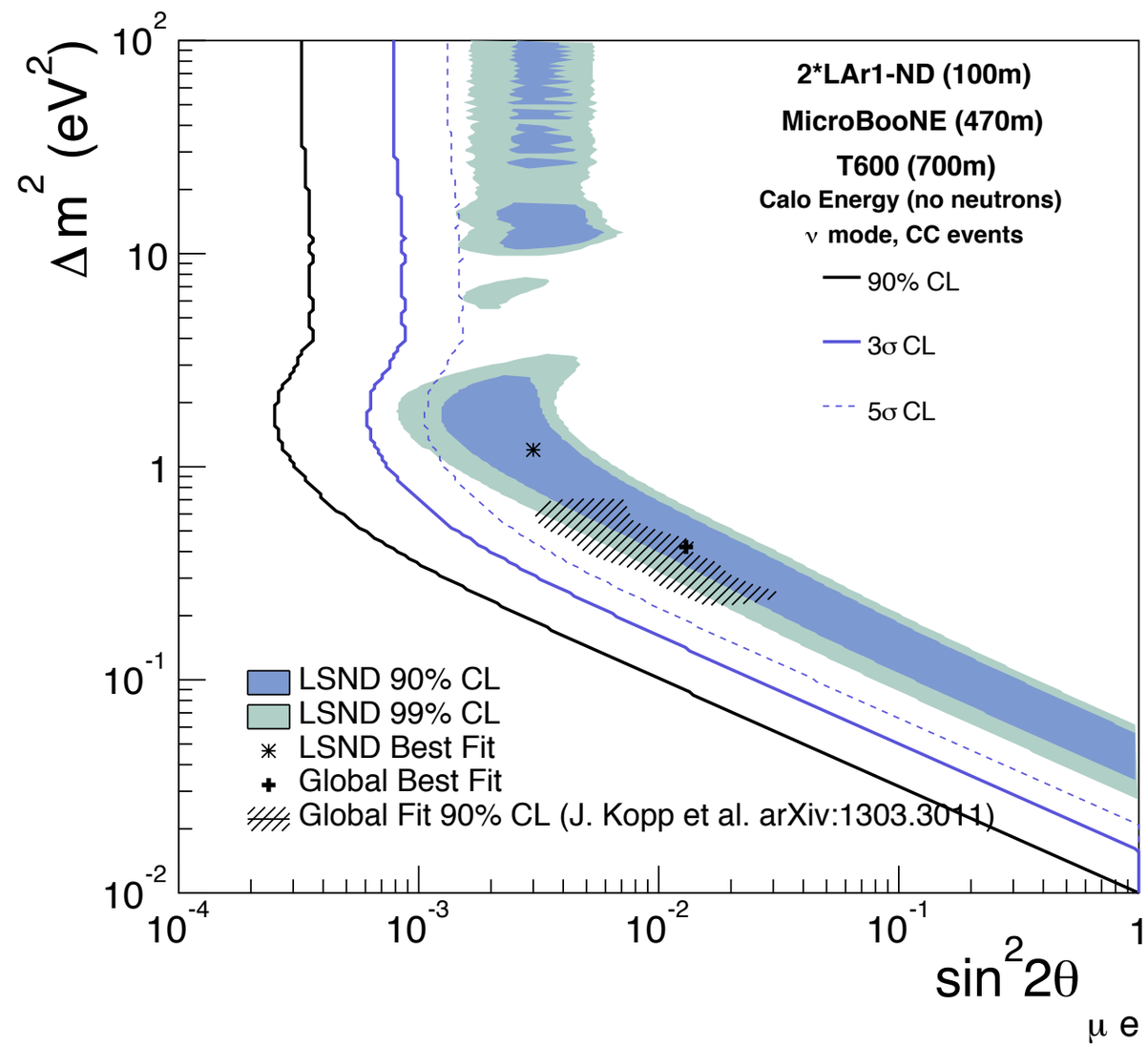


ND + uBoone + T600

LAr1-ND

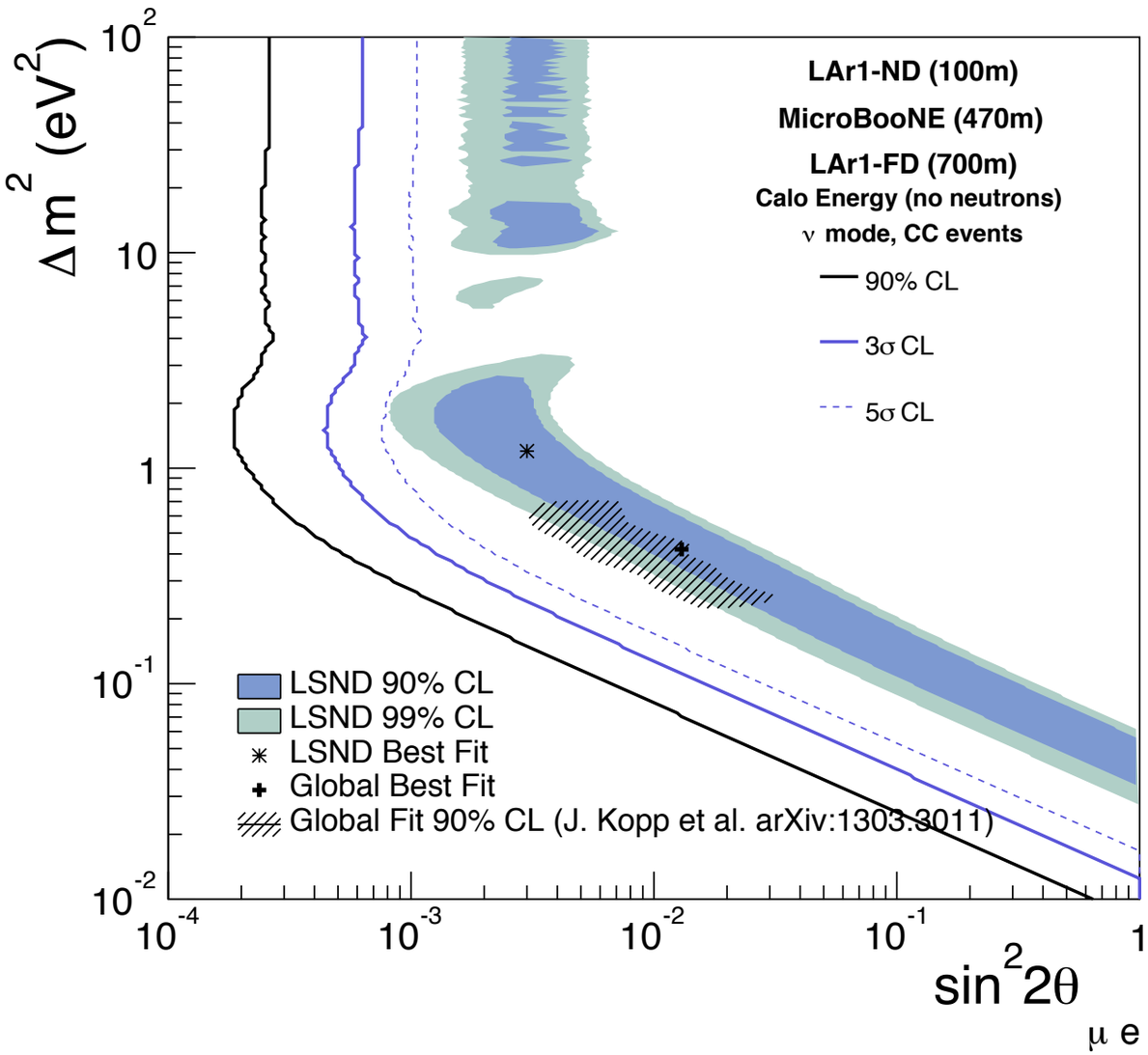


2*LAr1-ND

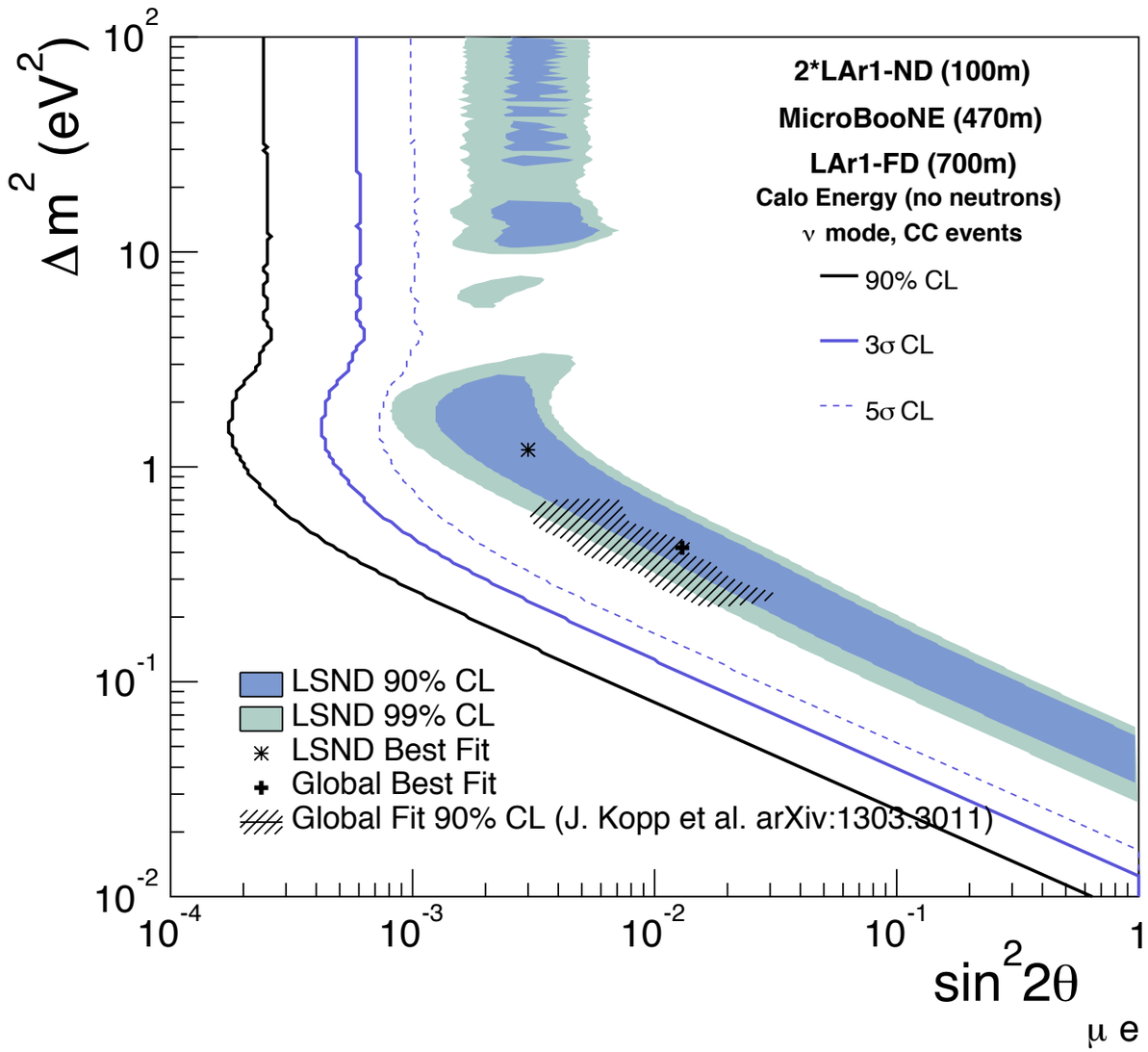


ND + uBoone + 1ktFD

LAr1-ND



2*LAr1-ND



Conclusion

- For this analysis, doubling the length of the near detector appears to be a negligibly small improvement. The measurement in the near detector is expected to be systematics limited already with LAr1-ND as proposed.

- Shower containment study is in progress to determine if the fiducial volume cuts stated above are valid - if not, will reevaluate the effect of detector length.

- Other comments or questions?