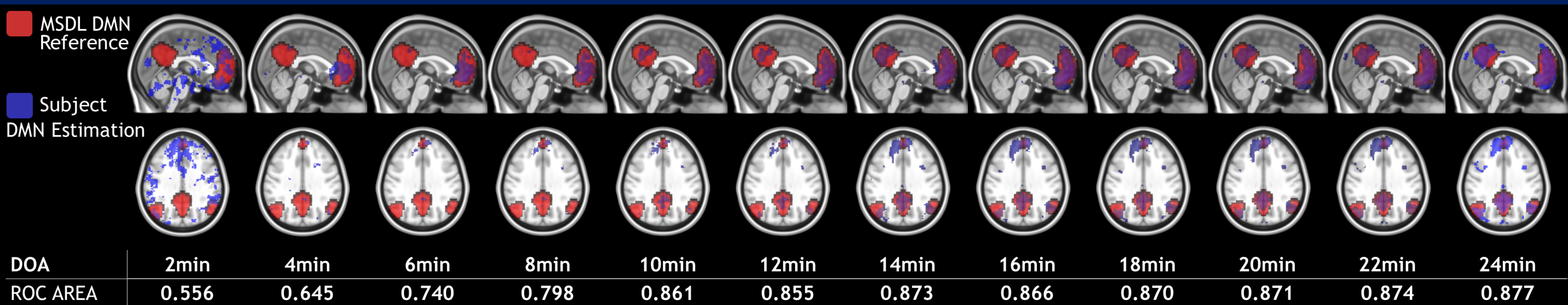


We suggest 14 minutes as an optimal acquisition duration for resting-state arterial spin labeling.



Investigating an Optimal Duration of Acquisition in Resting-State ASL

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INTRODUCTION

- To the best of our knowledge, there are no studies on the influence of the acquisition duration in resting-state ASL for functional network representation.
- As the default mode network characterizes resting-state, we focus on its evolution with respect to the acquisition duration, compared to a reference.

METHODS

- 6 right-handed healthy male subjects (21-28 y.o.)
- Sequence : pCASL, **24min30s**, 420 vol., TR=3.5s, LD=1500ms, PLD=1250ms
- 46 sub-acquisitions
→ 2min : 30s : 24min30s
- Classical preprocessing [1], done independently on each sub-acquisitions
- Seed Based Analysis (1% FWER)
- AUC with reference = MSDDL [2]
- Loess with 2nd degree local polynomials and 0.8 span

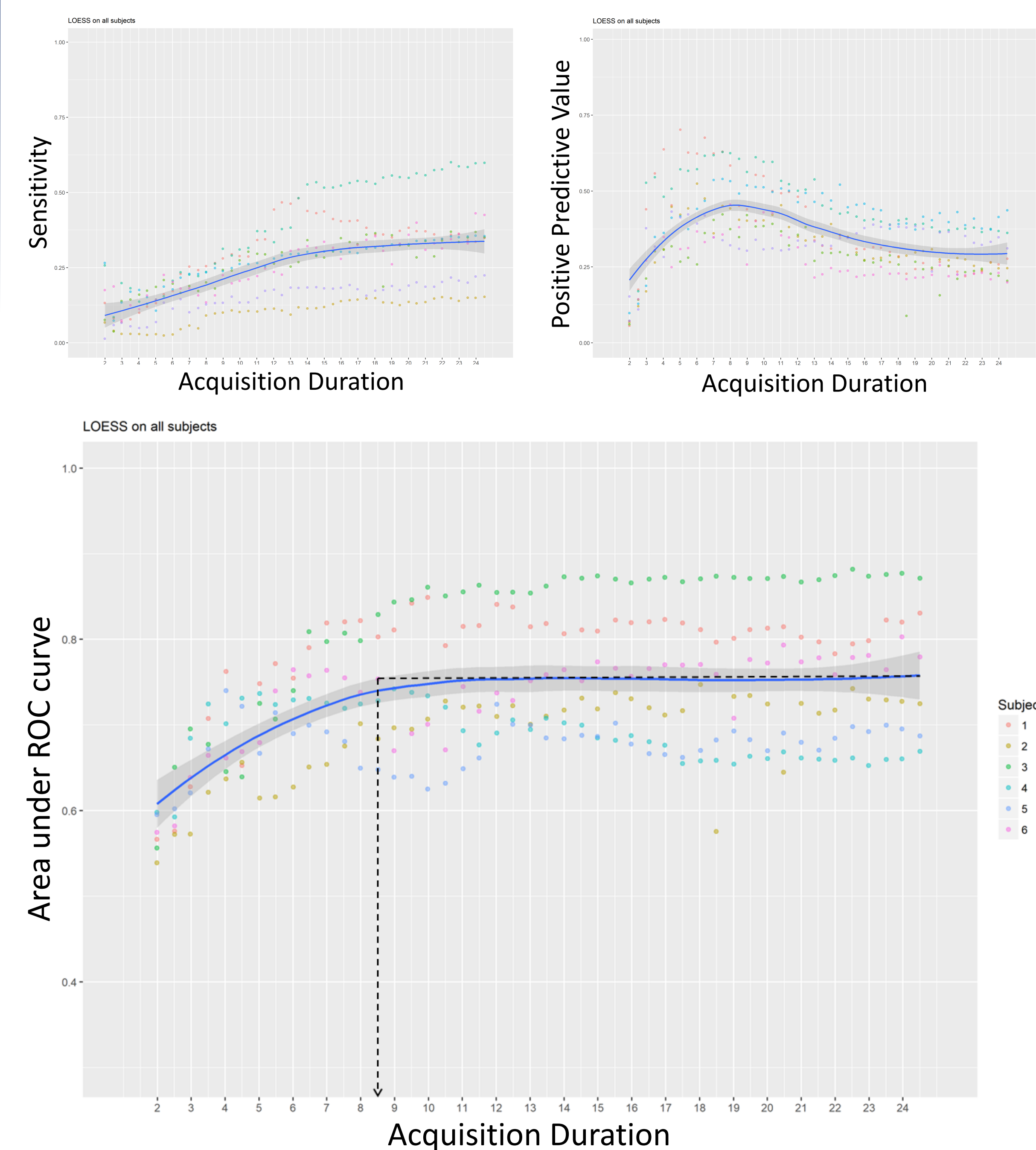
RESULTS

- Quality stabilizes after a certain duration.
- Considering a 95% confidence interval around the maximum, AUC is stable after 8min30s for the DMN.
- Different seeds with other references exhibit the same trend.

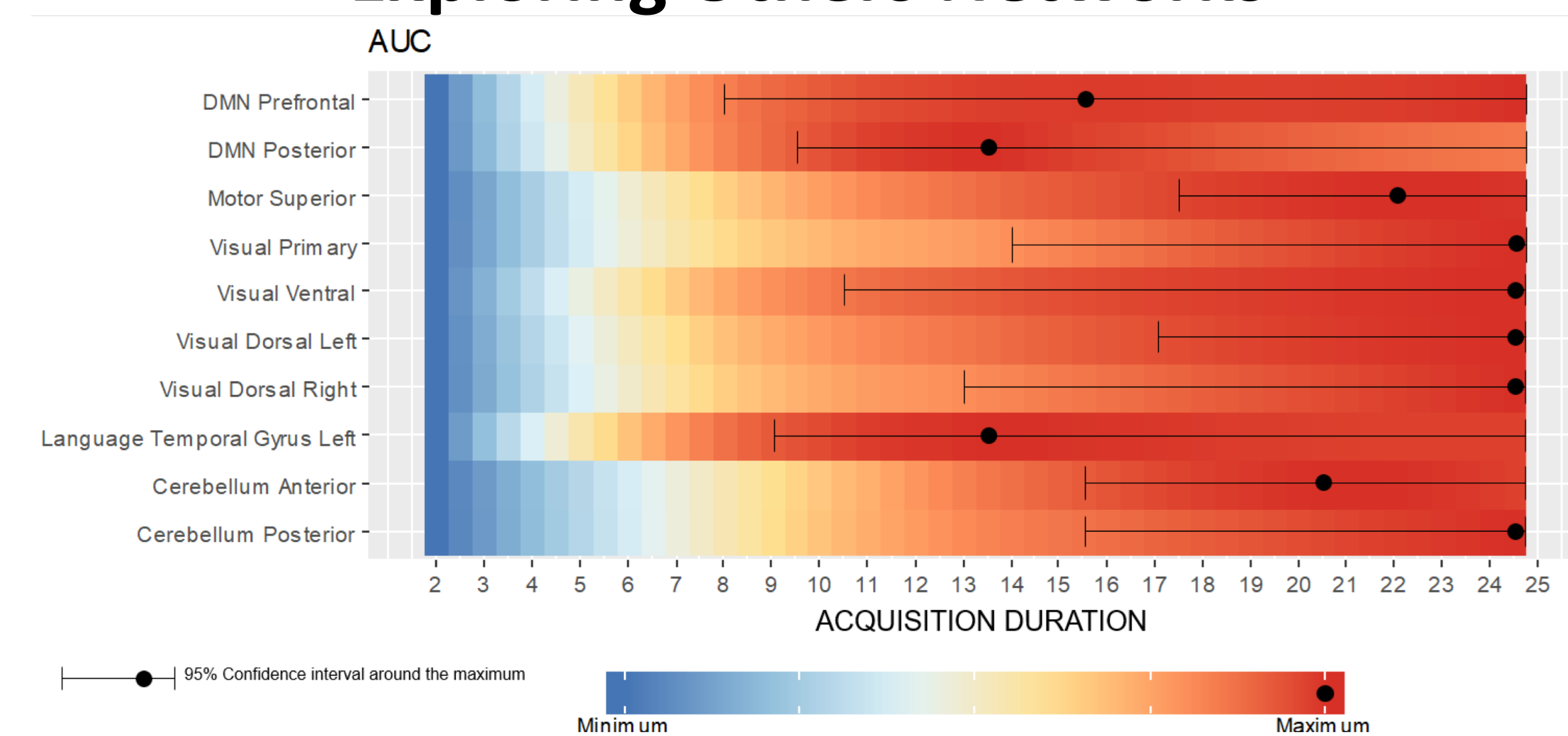
DISCUSSION

- An optimal acquisition duration could be the minimum duration to achieve the maximum score in almost all functional networks.
- It matches with the start of the stabilization
- We suggest 14min / 240 vol.**
- While it is not expected that the choice of the reference will really change the observed trend, some sequence parameters, such as PLD and TR may have a greater impact on the optimal duration.

Default Mode Network

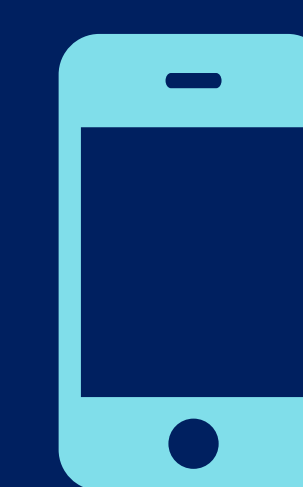


Exploring Others Networks



[1] *Characterizing Resting-State Brain Function Using Arterial Spin Labeling*
Chen J., Jann K., Wang D. - Brain Connectivity, vol. 5, issue 9 (2015)

[2] *Multi-subject dictionary learning to segment an atlas of brain spontaneous activity*
Varoquaux G., Gramfort A., Pedregosa F., Michel V., Thirion B. - Lecture Notes in Computer Science, vol. 6801 LNCS (2011)



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