

1 We would like to thank all reviewers for their time and feedback.

2 **Reviewer #1:** We will add the theorem statement from [21] to the appendix. You are right, this should be Eq. (5).
3 From Eq. (5) we bound

$$\text{stab}_t(X_t, \eta) \leq \text{ess sup}(\text{stab}(\mathcal{A}))$$

4 and plug in the learning rate according to Eq. (8).

5 **Reviewer #2:** We would like to thank the reviewer again for their detailed comments and observations.

6 **Reviewer #7:**

- 7 • In TS, the posterior distribution of the losses is used to compute the posterior of A^* from which the algorithm
8 samples. In MTS, there is an extra step where we calculate the mean of the posterior and then potentially use a
9 different sampling rule with the same mean. This remark basically says that if the selected sampling rule is
10 actually the posterior of A^* , then we can skip the calculation of the mean and the algorithm reduces to regular
11 TS.
- 12 • We will clarify Line 80.
- 13 • The functions g_t and f_t after Line 133 are intentionally defined for any $x \in \mathcal{X}$ and not only X_t , this is
14 necessary to properly define the stability coefficients.
- 15 • You are correct, we will add the clarification for Figure 1.