The authors explore to which extent current and future collider experiments can give bounds on specific leptoquark models which are motivated by the B-physics anomalies. For this they use direct searches as well as searches for di-leptons with high momentum using contact interactions. They take into account the complete multiplet structure of the leptoquarks if applicable which is an improvement compared to most of the literature. However, there are some aspects which need to be clarified before the paper could potentially be recommend for publication.

1. The authors consider contact interactions induced by leptoquarks with leptoquark masses as low as 1 TeV. This is not really justified and it is not clear if the angular distribution of the two leptons or their p_T spectrum resulting from say a leptoquark in the t-channel with a mass of let us say 2.5 TeV is the same as the one obtained from contact interactions. In other words, it is not obvious at which mass scale one can really trust the results from the contact interaction. The authors should discuss this and give an example.

2. Page 4, in the middle: They use only a minimal set of couplings contributing to a minimal set of possible operators. However, this choice of a particular flavour structure is not an RGE invariant statement and there is no reason why any UV completion should give this structure. For example, they do not allow for any decay into tau leptons which would clearly reduce the bounds obtained. Therefore, their statements given in the abstract and in the conclusions are too general. Consequently they should state these assumptions more clearly in the abstract and in the conclusions before making specific claims about the reach of certain colliders.

3. Section IIIA: I do understand the model set-up for the scalars but what precisely did they do in case of the U_1, usually one has two free parameters κ_c and κ_Y, see e.g. their ref. 55, which parameterize the origin of the U_1. These parameters depend on whether the U_1 is a gauge boson or composite state. While they do not affect the low energy constraints, they do impact on the pair production cross sections at the LHC (κ_c) and at a muon collider (κ_Y). How did the authors choose these parameters when they obtain the bounds on the direct searches or their predictions for future collider experiments?

4. Page 11: The authors claim that they obtain a bound of 1610 GeV/1785 on the U_1 case using their ref. 60. This is below the mass bounds they

obtain for the scalar leptoquarks. Even taking into account the multiplet structure of the scalars, this is rather surprising as vector states usually have larger cross sections than scalars. Moreover, there is a recent CMS analysis, arXiv:2402.08668, yielding a bound of 2120 GeV in the μb channel. These results should be taken into account.

5. The authors state they do not include NLO corrections for the cross sections in case of the contact interactions as this has not been done for the corresponding search. However, they fail to state what is done in case of the direct production of a leptoquark pair. In this case the higher order corrections are important, for both the current bounds, and are taken into account by ATLAS and CMS, as well as for the projections for future experiments at hadron colliders, see e.g. W.Beenakker at all arXiv:1601.02954 or C.Borschensky et al. arXiv:2002:08971, in case of a scalar leptoquarks. This has to be clarified.

6. Page 13: The authors claim at the end of the first paragraph in section IV that the case $y_{22} = y_{32}$ gives the highest sensitivity. However, it is not obvious why this should be the case. This needs further explanation.

7. Concerning the prospects at a muon collider: the leptoquarks will also impact top-quark pair production. Has this been taken into account?

Last but not least: ref. 1 and 2 are incomplete.