Response to the Referee

Referee Comment 1: *I agree with the recommendation of the first referee to recommend the paper to SciPost Physics. However I believe the discussion in the manuscript would be made stronger if the authors explicitly explain: What are the qualitative differences between $n = 1$ (conventional WSM) and $n > 1$ (mWSM).*

Our Response: We thank the referee for recommending acceptance of the paper after minor revision. Also, we thank the referee for raising this point.
The qualitative differences between a conventional WSM and mWSM are the following:

(i) The topological charge of the Weyl node in conventional WSM is $n = 1$, and for mWSM, it is $n = 2$ or 3.

(ii) The dispersion around a Weyl node in conventional WSM is isotropic in all momentum directions. On the other hand, for mWSM ($n > 1$), the dispersion around a double (triple) Weyl node becomes quadratic (cubic) along both k_x and k_y directions, while it varies linearly with k_z.

These qualitative differences reflect in the Faraday rotation of a Weyl semimetal in the thin-film limit. Specifically, the Faraday rotation Φ_F and corresponding ellipticity angles scale as n and n^2, respectively. We have now added a relevant comment in the revised manuscript (First and second paragraph of the discussion and conclusion section, Right column, Page 10).

Referee Comment 2: *Which of the signatures would remain visible in presence of additional trivial bands present on the Fermi level.*

Our Response: We thank the referee for this question. The presence of an additional trivial band at the Fermi level of mWSM would not affect the proposed results qualitatively. The trivial band has zero Berry curvature and therefore, it will not contribute to the intrinsic Hall conductivity $\sigma_{xy}^{(in)}$ in mWSM. Moreover, the total transverse Hall conductivity σ_{xy} is dominated by the topological nature of the Weyl fermions while the trivial band has negligible contribution to σ_{xy} in the absence of external magnetic field. We have now added a relevant comment on this in the third paragraph of the discussion and conclusion section of the revised manuscript (Third paragraph of the discussion and conclusion section, Left column, Page 11).