Referee Report - The Hampered Traveling Salesman Problem with Neighbourhoods

The paper proposes a Traveling Salesman Problem variant with Neighbourhoods and barriers. While neighbourhoods and barriers have been studied separately for TSP, this is the first work for propose MINLP formulations for the combined problem. The manuscript is overall well written, however I am not sure the presentation is sufficiently strong for this venue.

The paper is submitted as a Theory and Methodology manuscript. From a submission in this field, I believe a reader would like to appreciate a methodology with theoretical validation that makes it applicable, or generalizable, to other problems. In my opinion, the efforts into strengthening the MINLP formulations do not follow this direction. In addition, it seems implicit (other than in the abstract) that the problem assumptions and the choice of the ball neighrbors make the H-TSPN formulation a MIQCP (clearly Gurobi does not solve MINLP). The conditions under which the MINLP turns into a MIQCP, and eventual convexity/conic structure should be properly discussed.

Especificar

Comentar particular que en el caso no existe ese problema.

On the other side, the paper does not seem to advocate for an impact in solving innovative applications of OR, either. I am referring to:

- The assumptions A1-A4 in Section 2 (e.g. mutual position of the points, second-order cone representability of the neighborhoods), which may restrict the applicability of the formulations proposed in the real world.
- The very short presentation of computational results. The authors derive a number of ways to strenghten the MINLP formulations, such as valid inequalities and variable fixing, but the impact of such is not entirely evident in the computational result Section. The preprocessing time is not accounted for in Table 2, so it is not possible to establish a threshold of problem size for practical computations.
- Lack of comparison with related problems. For instance, why not adding barriers to the TSPN instances proposed by Gentilini et al.?
- How would the formulation behave computationally if the neighbors were not conic?

Ejecutar caso general con y sin preproceso.

Cambiar preprocessing por strengthening explicando que incluye variable fixing y v. inequ.

Mencionar trabajos CETSP y comparar resultados computacionales

Comentar que se puede expresar de forma general uniones de cuerpos cónicos.

Minor comments:

- p.3. Assumption A1. The authors refer to a "general case" in which line segments are not located in general position. It is not evident why this is more general than the "general position" case. A figure would help, also.

- Assumption A2. Again, a figure would help.