I am delighted to have the chance to review this manuscript. I would like to offer a concise overview of the paper, emphasizing its significant contributions, and also pose a few relevant questions for further consideration. The manuscript presents a novel methodology based on implicit neural representation networks for three-dimensional geological modeling. The methodology advances accurate and detailed geological modeling, particularly for complex subsurface structures. The key contributions include incorporating unconformities, handling complex geological features, integrating stratigraphic constraints, reducing modeling artifacts, and validating the approach through a case study. However, to further enhance the understanding and applicability of the proposed algorithm, addressing the following questions would provide valuable insights.

1. Modeling Complex Faults:

The paper introduces an implicit modeling approach that can handle multiple complex faults in a geological model. However, it's essential to understand how the method constructs geological models containing numerous complex faults. How does the methodology define geological domains when faults do not extend throughout the entire model space? Could the authors provide a synthetic or field example to demonstrate this?

2. Modeling Unconformities:

The methodology also addresses modeling unconformities, a critical aspect of geology. It's commonly challenging to obtain complete geometric information about subsurface unconformities in practice. How does the proposed method handle scenarios where only sparse and unevenly distributed information about unconformities is available? How are multiple geological domains defined in these cases, and how reliable are the resulting models near unconformity interfaces?

3. Effect of Loss Functions:

The paper employs various loss functions to incorporate stratigraphic and structural information during the training of the INR network. Could the authors present a clear example using one of their test datasets to demonstrate how well the trained network fits each individual constraint in the loss functions? Which constraint or loss function has a significant impact on the quality of the modeling results? How are the weights of these multiple loss functions determined, and do they need adjustment for different modeling tasks?

4. Consistency and Validity of Modeling Results:

The approach trains a neural network using defined loss functions and then employs the trained network for structural modeling. Can this method guarantee that the modeling results align with known structural features or achieve an exact fit? Additionally, since the loss functions are defined only on scattered points, can the effectiveness of the modeling results be ensured in other regions of the model?

5. Handling Limited Structural Information:

A notable strength of the approach is its ability to handle scenarios with limited structural information, often encountered in datasets with rare interface observations, such as outcrop datasets. Can the method still produce reliable and accurate structural modeling results in such cases? Could the authors provide one or two test examples to illustrate this?

6. **Efficiency and Generalization:**

Do different geological regions require separate network training? Should each geological domain divided by unconformities require individual structural modeling? Could the authors compare the modeling efficiency and accuracy of their learning-based method to traditional implicit modeling approaches, both using the same set of structural data?

7. **Network Architecture Impact:**

It would be helpful if the authors could provide more details about the specific architecture of the neural network used for implicit structural modeling. How does altering the number of network parameters impact the modeling results? How can one select an appropriate neural network architecture for structural modeling tasks when dealing with varying data and complexities?