# Article information:

On the determination of residual stress and strain fields by sharp indentation testing.: Part I: theoretical and numerical analysis - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S1359645401001227>

# Article summary:

1. Residual stress and strain fields in materials can have significant effects on fatigue, fracture, corrosion, wear, and friction.

2. Sharp indentation testing is a proposed method for measuring residual stresses/plastic strains at the nano-, micro- or macro-level.

3. Finite element techniques are used to analyze sharp indentation tests and investigate the influence of different quantities to arrive at simple quantitative relations suitable for an experimental situation.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article titled "On the determination of residual stress and strain fields by sharp indentation testing: Part I: theoretical and numerical analysis" provides an overview of the use of sharp indentation testing for measuring residual stresses and strains in materials. The article discusses various experimental techniques used for measuring residual stresses and strains, highlighting the limitations of these methods. The authors propose a method based on sharp indentation testing as an alternative to these methods.

The article provides a detailed analysis of the influence of residual stresses and strains on the results obtained from a sharp indentation test. The authors discuss previous studies that have investigated this issue, highlighting the limitations of these studies. They also provide a comprehensive parameter study using numerical methods to investigate the influence of different quantities on global indentation parameters.

Overall, the article is well-written and informative, providing valuable insights into the use of sharp indentation testing for measuring residual stresses and strains in materials. However, there are some potential biases in the article that should be noted.

Firstly, the authors rely heavily on previous studies to support their claims without providing sufficient evidence to support their own findings. While they do conduct their own parameter study using numerical methods, they do not provide enough detail about their methodology or results to fully evaluate their findings.

Secondly, there is a potential bias towards promoting sharp indentation testing as an alternative method for measuring residual stresses and strains in materials. While this may be a valid approach, it is important to note that there may be limitations to this method that are not fully explored in the article.

Finally, there is a lack of discussion about potential risks associated with using sharp indentation testing for measuring residual stresses and strains in materials. While this may not be directly relevant to the scope of the article, it would be useful to include some discussion about potential risks or limitations associated with this method.

In conclusion, while the article provides valuable insights into the use of sharp indentation testing for measuring residual stresses and strains in materials, there are some potential biases that should be noted. It would be useful for future research to address these biases and provide more comprehensive evaluations of this method.

# Topics for further research:

* Limitations of sharp indentation testing for measuring residual stresses and strains in materials
* Risks associated with sharp indentation testing for measuring residual stresses and strains in materials
* Comparison of sharp indentation testing with other methods for measuring residual stresses and strains in materials
* Effect of material properties on the accuracy of sharp indentation testing for measuring residual stresses and strains
* Influence of surface roughness on the results obtained from sharp indentation testing for measuring residual stresses and strains
* Validation of numerical methods used for investigating the influence of residual stresses and strains on sharp indentation testing results.

# Report location:

<https://www.fullpicture.app/item/9a9776d0a74ab67a049a453b565953a9>