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Document Version

Publisher's PDF, also known as Version of record

Publication date:

2004

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Nicola, L. (2004). *Stress and dislocations in thin metal layers*. [Thesis fully internal (DIV), Groningen]. s.n.

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Propositions
appended to the dissertation

Stress and dislocations in thin metal layers

Lucia Nicola
3 September 2004

- 1 Computer simulations in material science should be only intended as a tool for a better understanding of physical phenomena and an aid in the development of a suitable theory and not to mimic the real world as accurately as possible.
- 2 A model used to capture a size effect needs to contain at least one material length scale. However, the presence of several length scales, which is unavoidable in models based on discrete entities, makes the interpretation of the results not trivial.
- 3 Even though the predictions of the discrete dislocation plasticity model presented in this thesis are in qualitative good agreement with experiments, the attempt of finding a quantitative agreement by fitting the unknown parameters in the model to the experimental curves is not very meaningful, since the model does not incorporate all possible relaxation mechanisms.
- 4 As far as stress relaxation is concerned, the optimal shape for the cross-section of a passivated interconnect line is not a square.
- 5 Accurate measurements of hardness by micro-indentation are difficult to obtain. Simulations of indentation are also quite difficult: they are meaningful only if the contact area between indenter and specimen is represented accurately, which is easily obtainable only with flat indenters.
- 6 Glass-to-glass anodic bonding is an efficient and inexpensive technique which can be used in the production of chemical sensors. It only works, however, if the mobility of sodium ions in the coating layer on the anode glass wafer is lower than in the glass itself.