

Interactive comment on “Surface movement above an underground coal longwall mine after closure” by A. Vervoort

Anonymous Referee #2

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General comments Very interesting article, especially since the issue of the residual subsidence and the uplift of the area after mining activity in Europe is increasingly important due to the fairly widespread liquidation of active underground European mining. The paper address relevant scientific and technical questions within the scope of NHES. The paper present new data and results. There is up to international standards. The methods and assumptions are valid and clearly outlined. The results are sufficient to support the interpretations and the conclusions. The author reaches substantial conclusions. The description of the data, the method and the results obtained is sufficiently complete and accurate to allow their reproduction by fellow scientists. The title clearly and unambiguously reflect the contents of the paper. The abstract provide a concise, complete and unambiguous summary of the work and the obtained results. The title and the abstract are pertinent, and easy to understand to a wide and

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diversified audience. The overall presentation is well structured, clear and easy to understand by a wide and general audience. The length of the paper is adequate. The technical language is precise and understandable by fellow scientists. I am not English but in my opinion the English language is of good quality, fluent, simple and easy to read and understand by a wide and diversified audience. Specific comments 1) It is interesting how accurate is the method of interferometry especially for just such analysis. It would be interesting, if possible, to compare the measurement results with the results of measurements of the classical levelling method. 2) Conclusions are interesting but also intuitive. If uplift is associated with swelling of clay minerals that should be linked to the phenomenon of rising water levels and the occurrence of these minerals in the geological layers. As noted in an article in Carboniferous there are no clay layers. These occur in the overburden. Therefore, uplift should be associated with the liquidation of depression cone throughout its previous range, befor mining activity has been finished. Uplift should occur actually in the area where there is no mined out coal seams - that is just around the shaft because there is still a safety pillar of the vertical shaft. The caving above exploited coal seams serve as ways of spread of water. Therefore, one should not expect the uplift especially above areas of former mining operation. Subsidence and uplift there are independent phenomena, only slightly linked by the mining operation. This is somewhat due to the paper, and was confirmed by the Author of the article. 3) It would be interesting to analyse the uplift of the ground in respect to the rising of water levels in different aquifers. 4) The phenomenon of the residual subsidence is time dependent, it is obvious and has been stressed in the article. Therefore, it is difficult to assess real residual subsidence above the area of different mine panels, each of which ended its activity at different periods of time. On the contrary, the assessment of uplift is associated with a rise of the water and it can be well assessed after 1992 when pumping of the mine water has been finished. 5) It is not easy to understand the sequence of Figures 3a and 3b, and 6a and 6b. In Fig. 3a and 3b the phenomena are presented chronologically and 6a/6b contrariwise, it is very difficult to interpret. Perhaps it makes sense but I have not found a justification

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for such order. 6) In the list of references there is no one position of Polish literature. Knothe theory, which was crucial for the prediction of subsidence has been recalled from Chinese literature, what is curious (587-589).

Technical correction 1) Figures 3 and 6 are difficult to read. Probably the coloured symbols would be better. And perhaps Author should use some other symbols to display the different settlement and uplift classes? 2) To assess whether there is a relationship between the operation and the residual subsidence and uplift in Figures 3 and 6 the contours of operation should be shown. Without this the assessment is very difficult; 3) On the Figures 1, 3 and 6 there is no section line drawn. It is a pity, because it would make easier the interpretation of the results presented on Figures 4, 7 and 8;

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