**Team:** Affengeschrei

**Summary:** Overall an ok report showing that data were adequately acquired. There are some inconsistencies in the interpretations which can be excused given that this specific target location does not comply with the simplistic “induced dipole” model treated in the lecture. Inclusion of a forward model is helpful for this. Below some remarks which might be helpful for the next report.

**Grade:** 2.3

**Formal:**

* There are no external references. At some locations those are clearly missing (e.g., data used in Figs. 2 & 3) elsewhere they would have been helpful.
* Some Figures are grainy and with small labels. Colorbars are missing in Figs. 4 & 5. Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) and a spatial scalebar. A GIS can do this for you.
* It is not clear where the profile of Fig 6 is located in Figs 2 & 3.
* Structuring is ok but not fully adhered to: Introduction contains elements from methods and conclusions. Conclusion contains elements of methods.

**Data:**

* look good.

**Content:**

* Gradiometers do not provide difference between the “*Totalmagnetfeld und der Anomalie*.” They provide the vertical (or horizontal) gradients measured with two sensors at different heights (distances).
* Well argued that temporal variability is negligible here.
* The expectations of a dipole pattern with positive and negative anomalies are correct **IF** the sub-surface target is an induced dipole parallel to the Earth’s magnetic field. This assumptions must be check with the geographic orientation of the anomaly relative to local declination. In this case this will show that the assumption does not hold.
* It is unclear where the profile was located to estimate the HW. Was it taken along or across the suspected pipeline location? This probably explains the large discrepancies of 1 – 15 m in estimated depth.
* I don’t follow the interpretation that the anomalies are formed by the endpoints of the pipeline. Is it reasonable to assume that the pipeline (which is hundreds of kilometers long) starts and/or ends at this location?

**Take-Away:**

* Okish given that the original expectations of an induced dipole do not apply at this location.
* What’s the advantage of the different sensors applied?

**Reproducibility:**

* What was height of the sensors above ground?
* Where was the basestation located?

**Team:** EJ\_KLAA Wuhu

**Summary:** Overall a good report showing that data were adequately acquired. The interpretations were difficult given that this specific target location does not comply with the simplistic “induced dipole” model treated in the lecture. Below some remarks which might be helpful for the next report.

**Grade:** 1.7

**Formal:**

* Figs 5&6 have no label or units on colorbar.
* Although all Figures are distinct, they also show much information twice. Consider condensing to make the report more succinct. For example, unfiltered raw data can also be shown in the Appendix.
* Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) and a spatial scalebar. A GIS can do this for you.

**Data:**

* look good.

**Content:**

* Slightly more precise language when describing the sensors. E.g., the Fluxgate can measure the spatial (not temporal) gradient using two sensors. “Änderungsrate” is temporal.
* Removal of data does not increase resolution but it helps to focus on relevant information in the figure (end of p. 8).
* Fig 3 is nice. Maybe better displayed in a two column figure together with Fig. 2.
* The half-width criteria does not hold for gradient data.

**Take-Away:**

* Ok given that the original expectations of an induced dipole do not apply at this location. The discussion about remanence is insightful.
* What’s the advantage of the different sensors applied?

**Reproducibility:**

* What was height of the sensors above ground?
* Where was the basestation located?

**Team:** Gneiss und Happy

**Summary:** Strong report with nice Figures and adequate interpretation including the use of a forward model. Fluently and succinctly written. Below some remarks which might be helpful for the next report.

**Grade:** 1.3

**Formal:**

* Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) in addition to the existing spatial scalebar. A GIS can do this for you.
* Parts of introduction belong to methods.
* External references are missing (e.g. for the forward model).
* The inferred depth of 3.14 m seems too precise (suggesting that depth can be determined to the cm level).
* Minor mistake: “Vorlesungsfolien” cannot be referenced. It is not a book or any other quality controlled source which would be around for a longer time.

**Data:**

* look good.

**Content:**

* Overall well done. I appreciate inclusion of the forward model.
* Fig 9: Nice Figure. The Earth’s magnetic, however, isn’t quite that vertical.

**Take-Away:**

* What’s the advantage of the different sensors applied? Not needing a reference station is only a secondary advantage to the gradiometer data.

**Reproducibility:**

* What was height of the sensors above ground?
* Where was the basestation located?

**Team:** Hydroxy

**Summary:** Overall a nice report that includes the possibilities of remanence in the interpretation. The way it is written, however, this is more stated as an a-priori known fact rather than an inference from the data. Inclusion of a forward model can further strengthen the interpretation of the results.

**Grade:** 2.0

**Formal:**

* Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) in addition to the existing spatial scalebar. A GIS can do this for you.
* Remanence should be a result of the report, not part of the introduction. This  
  his is not known ahead of time.
* External referencing can be improved. Just providing an internet link is not scientific standard.
* Captions can be more detailed (e.g., what does the pink color represent in Fig. 7?)

**Data:**

* look good.

**Content:**

* The HW criteria does not apply to the vertical gradients.
* Nice that you explicitly included the height of the sensors.

**Take-Away:**

* What’s the advantage of the different sensors applied?

**Reproducibility:**

* Where was the basestation located?
* What was height of the sensors above ground?

**Team:** M^2EF

**Summary:** The report shows that data were adequately collected. The text, however, appears disconnected in parts and contains partially superfluous Figures which can be more succinctly presented. Also the interpretation of the results does not fully capture the content covered in the lecture, however, this can to a certain extent be excused as the observed anomaly does not comply with a simple “induced” magnetic dipole covered in class. Below some comments which might be helpful for the next report.

**Grade:** 2.5

**Formal:**

* Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) in addition to the existing spatial scalebar. A GIS can do this for you.
* Captions need more detail and clarity. E.g “Bei den Meter 8 bis 17 ..“ it is unclear if you refer to the x- or the y-dimensions.
* Figs. should be numbered and each Figure needs a caption.
* This is not graded here, but I suggest to better watch out for spelling mistakes e.g. by using spellcheckers.
* There is a mix-up between methods and results. The matlab code is methods and should not appear in the results. It is also not customary to include it within the text. The code should instead be in the appendix or provided as a separate file.
* The portrayal of observations as a table is an interesting idea but not suitable for larger datasets. Much better to use heatmaps as done, e.g., on page six. What does the color of the numbers represent?
* The text appears disconnected in parts. Try to formulate coherent paragraphs which are linked to each other and which logically refer to the Figures.
* Fig on page 14 looks nice but is missing units on the y-labels.
* External references are missing.

**Data:**

* look good.

**Content:**

* The magnetic anomaly has differing signs. This is linked to the ‘North and South’ Pole of the pipeline, but how this works in details is unclear (e.g, is the pipeline only within the research grid and does not extent further? Do we see induced or remanent magnetization?)
* Why was it not possible to apply the half-width criteria?

**Take-Away:**

* What’s the advantage of the different sensors applied?

**Reproducibility:**

* Where was the basestation located?

**Team:** Bierdeckelrechnung

**Summary:** Strong report, with good model integration, nice graphics and succinctly written. Below some remarks which might be helpful for the next report.

**Grade:** 1.3

**Formal:**

* Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) in addition to the existing spatial scalebar. A GIS can do this for you.
* Some parts from introduction (e.g., size of grid) belong to methods.
* The profiles shown in Fig 6 should be located in some of the result figs.

**Data:**

* look good.

**Content:**

* Nice pictures (e.g., Fig 2). This gives a good impression of the research area.
* There is more information in the gradiometer than just independence of temporal field variability. The gradient is more sensitive to near surface targets (I now see that this is stated lower in the discussion, but it should be stated here.).

**Take-Away:**

* What’s the advantage of the different sensors applied?

**Reproducibility:**

* Where was the basestation located?

**Team:** The last ones

**Summary:** Overall well-structured report including integration of a simple forward model. Data are well displayed and interpreted. Some remarks which might be helpful for the next report are mentioned below.

**Grade: 1.5**

**Formal:**

* Overview figures with a higher geoscientific standard should contain axis labels (i.e. coordinates) in addition to the existing spatial scalebar. A GIS can do this for you.
* Locate P1 and P2 also in Figs 4,5,..
* Figs 4,5 miss a label & units for the colorbar.
* Use individual paragraphs in the discussion, each with a dedicated take away.
* Ref [3]:When citing an online source the link and data accessed is necessary but not sufficient. Try to find more information (e.g., in the impressum) about who is responsible for the content.

**Data:**

* look good.

**Content:**

* Methods: Why are you “only” interested in the vertical component?
* Nice to have eq. (1) included. Here an external reference would be appropriate.
* Fig 7 the half-width criteria does not applied for gradient data.
* Fig 8: nice to see a forward model integrated. It could be improved by modelling the expected situation (laterally extended pipe) rather than a point dipole.
* Discussion nicely works out the remnant effect at the correct location in the report.

**Take-Away:**

* What’s the advantage of the different sensors applied?

**Reproducibility:**

* Where was the basestation located?
* What was height of the sensors above ground?