



Reversed contrast

between drawn part and darker part on blackboard

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1. Problem



On a blackboard, it occasionally happens that lines or letters drawn by chalk will still be seen in a reversed contrast after being erased, which looks like a darker part. This phenomenon commonly arises on a dry day, and it takes place more efficiently with corduroy (cotton) eraser than with polyester fabric, where polyester tends to become electronegative. This research focused on revealing how the event occurs.

2. Hypothesis

This phenomenon is caused by static electricity generated by the chalk rubbing against a blackboard surface.

3. Methods

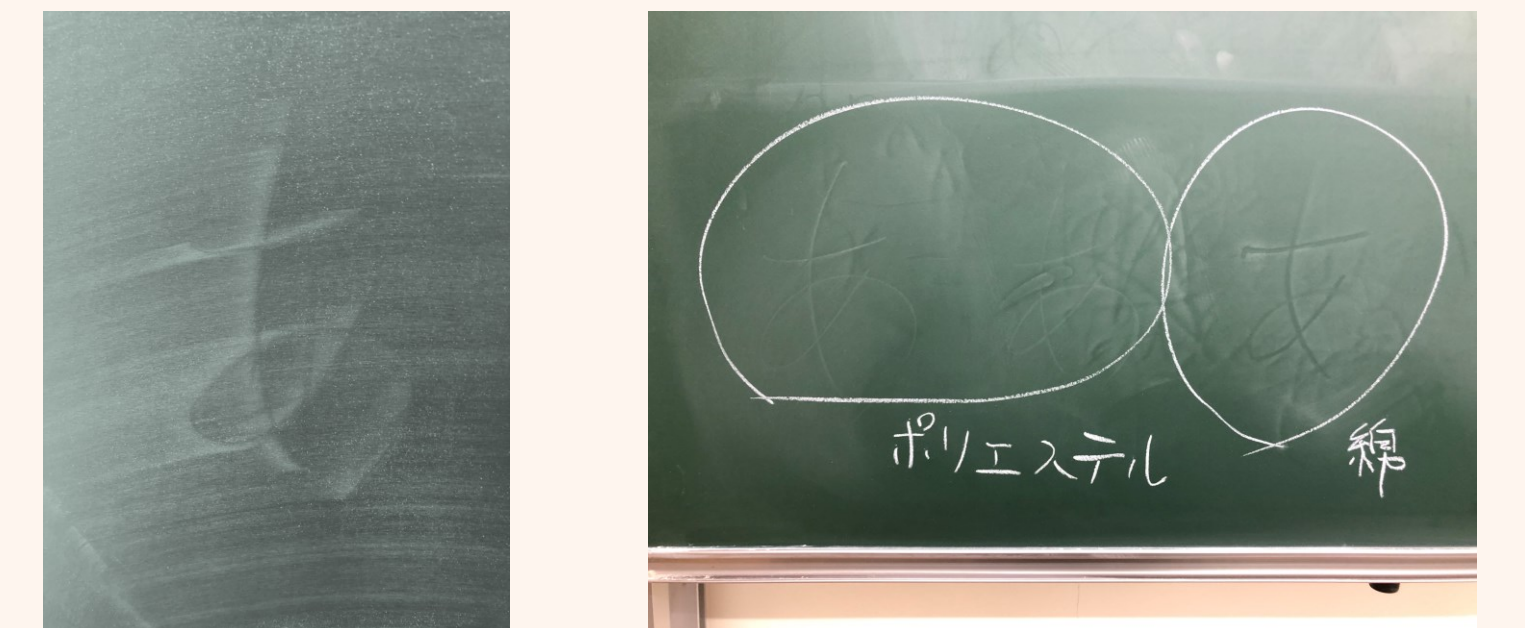
Experiment 1:

Rubble a blackboard surface as if writing on it with chalk, cotton cloth, and polyester cloth. And then wipe, assessment whether the phenomenon is occurring.

Experiment 2:

Erase handwritings written by chalk with cotton cloth, and polyester cloth, blackboard eraser, and microfiber cloth.

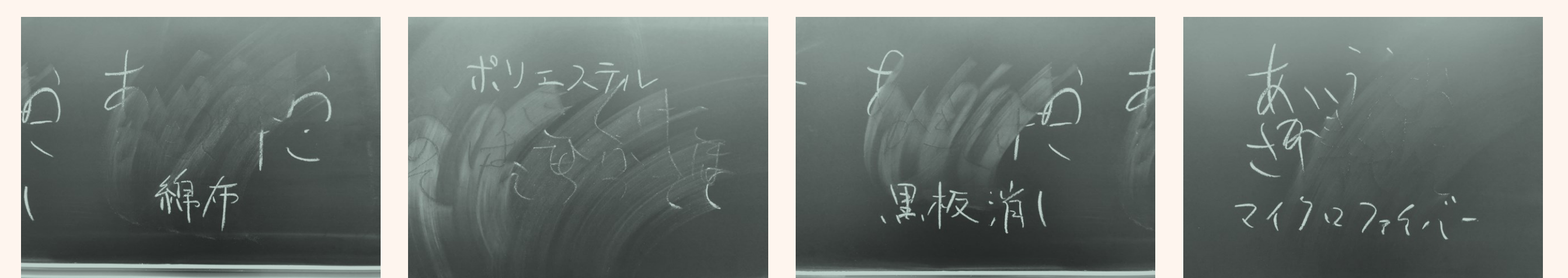
4. Findings



Experiment 1:

Chalk: + Cotton cloth: + Polyester cloth: -

Experiment 2:



Cotton cloth: + Polyester cloth: -

Blackboard eraser: + Microfiber cloth: -

5. Interpretation/Discussion

In those experiments, the effects of friction between writing and erasing were investigated.

Cotton cloth tend to produce this phenomenon. By contrast, polyester cloth not tend to produce it.

On the other hand, it was never revealed whether the phenomenon was truly caused by static electricity. it should be noted that these results are not certain whether they are caused by static electricity or not (such as the surface of clothes).

6. Reference

- Hyeyoung KIM; Shino OKUDA; Yoshikazu NAKANE, "Study on Luminance Contrast of Characters on Blackboard", J. Archit. Plann. Environ. Eng., AIJ, No.498, 23-29, Aug., 1997
- Takao YAKOU; Keijiro YAMAMOTO; Ken-ichi HORI, "Relation between Sensory Evaluation of the Grasping Cylinder with Lifting Hand and the Arch of Hand", Mechanical Engineering Journal, Vol.66, No.641, 202-207, Jan., 2000