The aim of the current study is to develop such a technique to evaluate the surface conditions of a polishing pad.

The proposed technique is based on contact image analysis using an image rotation prism.

**Objective**

The pad surface are affected by dressing

**Back ground**

Dresser

Polishing pad

The pad surface are affected by dressing

**Apparent contact conditions**

Polishing pressure

Wafer

Real contact conditions

Polishing pressure

Pad

Locally pressure affects

No effective method for pad surface evaluation have been established

It is not even clear that relationship between pad and dressing conditions

We propose a technique based on contact image analysis

We check up the quantitative parameter for pad surface evaluation

We discuss the effect of dressing conditions for pad characteristics

**Approach**

Using Image Rotation Prism

A type of optical glass.

Incident light from the side of the prism becomes to totally reflected at the prism bottom surface when nothing is in contact with it.

When there are contact points to the bottom surface of the prism, the light diffusely reflected.

Method of acquiring contact image

Quantitatively measurement

Observed contact images for different dressing conditions

Before dressing

Mesh size #80

Mesh size #100

Mesh size #500

Mesh size #1000

7.3mm × 5.5mm (1600 pixel × 1200 pixel)
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Advance of the evaluation parameters

Number of contact points
Number of white points as contact points

The number of peaks in the spectrum of the contact points

Image spectrum

Contact ratio
The ratio of the apparent contact area and the real contact area

Maximum value of minimum spacing of contact points
The maximum in a set of the minimum of spacing of contact points

Half width of peak of spatial FFT result
This parameter seems to be a quantitatively measure of the cohesion of contact points

Quantitatively evaluation results

Experimental conditions
Mesh size of dresser
#80, #100, #500, #1000

Outer/ Inter diameter of dresser
100mm/ 82mm

Dressing time
60min

Dressing pressure
150gf/cm²

Dresser rotation speed
2rpm(CW)

Pad rotation speed
30rpm(CW)

Offset of dresser
125mm

Polishing pad
MH-S15A

Change in mesh size of dresser
Change in dressing time

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