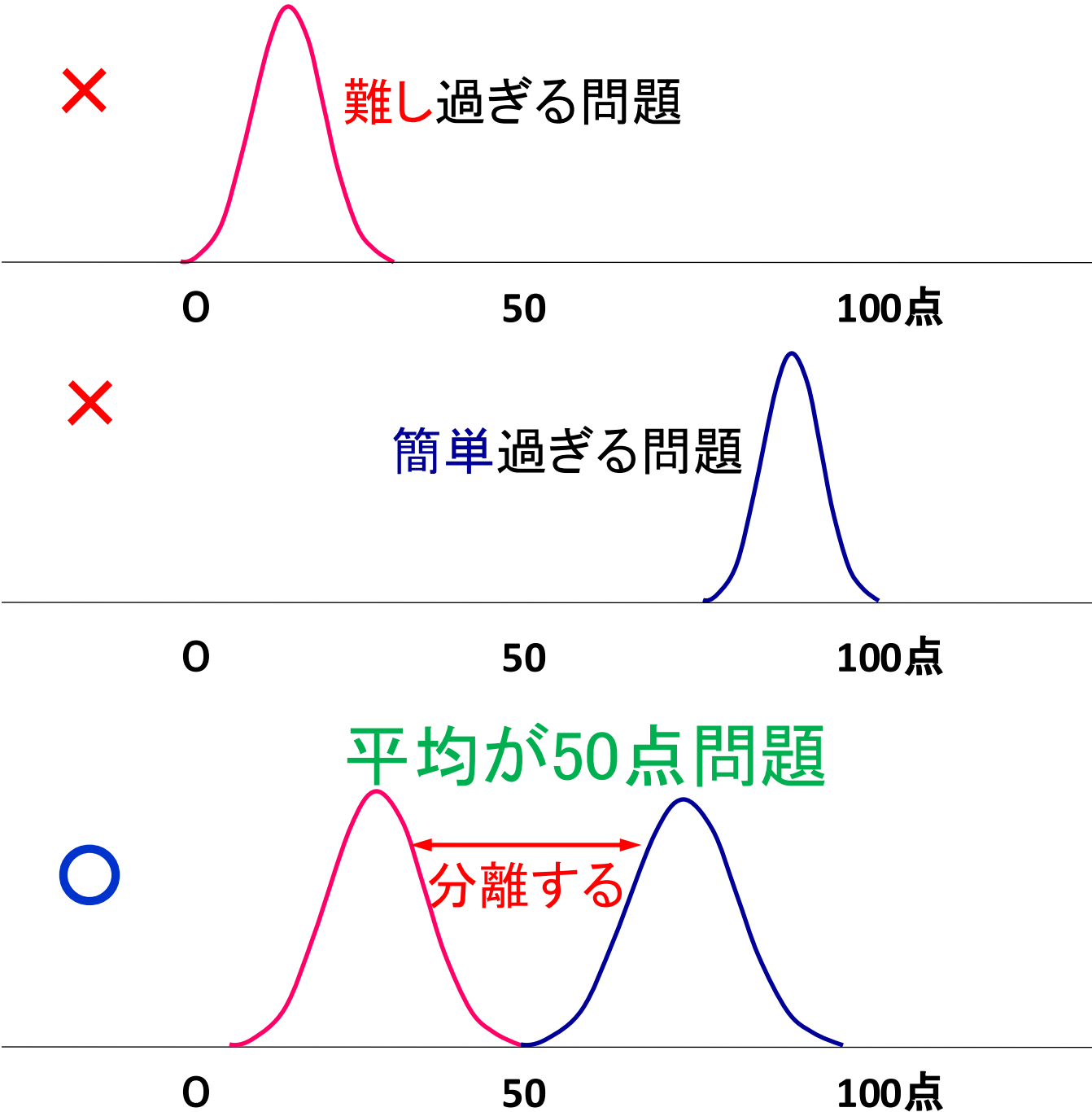


L18直交表実験の半分が測定結果×でもOK  
むしろ、その方が好ましい

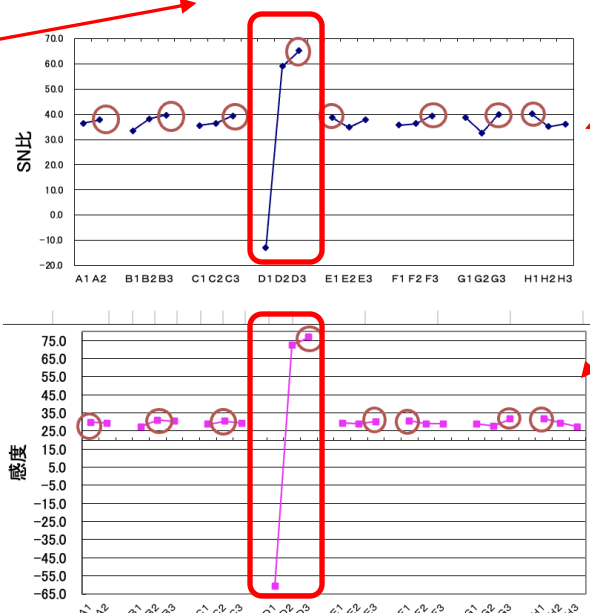
| L  | A | B | C | D | E | F | G | H | SN比 |
|----|---|---|---|---|---|---|---|---|-----|
| 1  |   |   |   |   |   |   |   |   | ○   |
| 2  |   |   |   |   |   |   |   |   | ○   |
| 3  |   |   |   |   |   |   |   |   | ×   |
| 4  |   |   |   |   |   |   |   |   | ×   |
| 5  |   |   |   |   |   |   |   |   | ○   |
| 6  |   |   |   |   |   |   |   |   | ×   |
| 7  |   |   |   |   |   |   |   |   | ×   |
| 8  |   |   |   |   |   |   |   |   | ○   |
| 9  |   |   |   |   |   |   |   |   | ×   |
| 10 |   |   |   |   |   |   |   |   | ○   |
| 11 |   |   |   |   |   |   |   |   | ○   |
| 12 |   |   |   |   |   |   |   |   | ×   |
| 13 |   |   |   |   |   |   |   |   | ×   |
| 14 |   |   |   |   |   |   |   |   | ○   |
| 15 |   |   |   |   |   |   |   |   | ×   |
| 16 |   |   |   |   |   |   |   |   | ○   |
| 17 |   |   |   |   |   |   |   |   | ○   |
| 18 |   |   |   |   |   |   |   |   | ×   |



①計測不能の欠測箇所(黄色)に「0.01」を入れて計算

|     | N1             |                |                | N2             |                |                | SN比    | 感度    |     |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|--------|-------|-----|
|     | M <sub>1</sub> | M <sub>2</sub> | M <sub>3</sub> | M <sub>1</sub> | M <sub>2</sub> | M <sub>3</sub> |        |       |     |
| 圧力  | 0.10           | 0.20           | 0.30           | 0.10           | 0.20           | 0.30           | $\eta$ | S     |     |
| L1  | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | -13.0  | -60.6 | L1  |
| L2  | 0.01           | 0.01           | 28.9           | 0.01           | 0.01           | 40.8           | 45.3   | 68.1  | L2  |
| L3  | 10.7           | 21.0           | 27.6           | 11.2           | 23.0           | 30.6           | 69.3   | 74.7  | L3  |
| L4  | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | -13.0  | -60.6 | L4  |
| L5  | 15.9           | 25.6           | 35.2           | 12.7           | 25.0           | 32.1           | 69.0   | 77.4  | L5  |
| L6  | 18.3           | 27.9           | 33.8           | 16.5           | 29.8           | 31.6           | 64.0   | 78.1  | L6  |
| L7  | 0.01           | 12.7           | 22.7           | 0.01           | 12.4           | 24.6           | 54.0   | 67.7  | L7  |
| L8  | 15.1           | 42.1           | 47.1           | 16.2           | 45.3           | 39.8           | 65.0   | 83.3  | L8  |
| L9  | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | -13.0  | -60.6 | L9  |
| L10 | 0.01           | 21.1           | 35.5           | 0.01           | 21.0           | 31.8           | 58.0   | 74.7  | L10 |
| L11 | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | -13.0  | -60.6 | L11 |
| L12 | 11.8           | 14.9           | 15.9           | 14.4           | 17.1           | 18.8           | 54.2   | 67.9  | L12 |
| L13 | 0.01           | 15.3           | 42.2           | 0.01           | 18.1           | 41.9           | 56.8   | 76.5  | L13 |
| L14 | 12.1           | 23.7           | 27.3           | 12.8           | 24.1           | 29.0           | 65.2   | 75.0  | L14 |
| L15 | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | -13.0  | -60.6 | L15 |
| L16 | 7.2            | 20.9           | 31.9           | 9.2            | 21.0           | 33.4           | 70.3   | 75.4  | L16 |
| L17 | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | -13.0  | -60.6 | L17 |
| L18 | 14.3           | 23.5           | 34.9           | 11.8           | 22.6           | 34.3           | 75.1   | 77.1  | L18 |
|     |                |                |                | Min            |                |                | 54.0   | 67.7  |     |

SN比 $\eta$ あるいは感度が小さくなり過ぎる → D以外の要因効果が見難くなる  
→利得が大き過ぎる

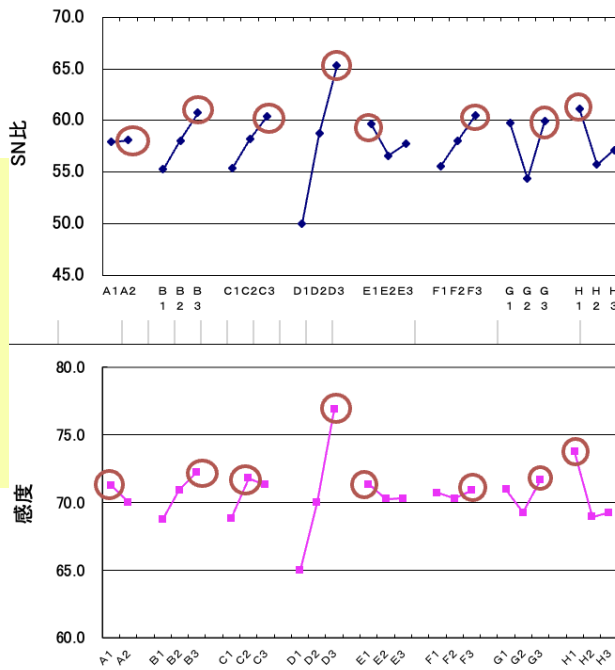


|    | 最適   | 最悪    | 利得    |
|----|------|-------|-------|
| 推定 | 80.8 | -29.3 | 110.1 |
| 確認 | 24.7 | 14.6  | 10.1  |

②計測可能な行のSN比あるいは感度の最小値から3db差し引いた値を欠測箇所に代入

|     | N1             |                |                | N2             |                |                | SN比    | 感度   |     |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|--------|------|-----|
|     | M <sub>1</sub> | M <sub>2</sub> | M <sub>3</sub> | M <sub>1</sub> | M <sub>2</sub> | M <sub>3</sub> |        |      |     |
| 圧力  | 0.10           | 0.20           | 0.30           | 0.10           | 0.20           | 0.30           | $\eta$ | S    |     |
| L1  | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 50.0   | 65.0 | L1  |
| L2  | 0.01           | 0.01           | 28.9           | 0.01           | 0.01           | 40.8           | 50.0   | 65.0 | L2  |
| L3  | 10.7           | 21.0           | 27.6           | 11.2           | 23.0           | 30.6           | 69.3   | 74.7 | L3  |
| L4  | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 50.0   | 65.0 | L4  |
| L5  | 15.9           | 25.6           | 35.2           | 12.7           | 25.0           | 32.1           | 69.0   | 77.4 | L5  |
| L6  | 18.3           | 27.9           | 33.8           | 16.5           | 29.8           | 31.6           | 64.0   | 78.1 | L6  |
| L7  | 0.01           | 12.7           | 22.7           | 0.01           | 12.4           | 24.6           | 54.0   | 67.7 | L7  |
| L8  | 15.1           | 42.1           | 47.1           | 16.2           | 45.3           | 39.8           | 65.0   | 83.3 | L8  |
| L9  | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 50.0   | 65.0 | L9  |
| L10 | 0.01           | 21.1           | 35.5           | 0.01           | 21.0           | 31.8           | 58.0   | 74.7 | L10 |
| L11 | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 50.0   | 65.0 | L11 |
| L12 | 11.8           | 14.9           | 15.9           | 14.4           | 17.1           | 18.8           | 54.2   | 67.9 | L12 |
| L13 | 0.01           | 15.3           | 42.2           | 0.01           | 18.1           | 41.9           | 50.0   | 65.0 | L13 |
| L14 | 12.1           | 23.7           | 27.3           | 12.8           | 24.1           | 29.0           | 65.2   | 75.0 | L14 |
| L15 | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 50.0   | 65.0 | L15 |
| L16 | 7.2            | 20.9           | 31.9           | 9.2            | 21.0           | 33.4           | 70.3   | 75.4 | L16 |
| L17 | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 0.01           | 50.0   | 65.0 | L17 |
| L18 | 14.3           | 23.5           | 34.9           | 11.8           | 22.6           | 34.3           | 75.1   | 77.1 | L18 |

今回  
SN比は50.0  
感度は65.0  
とする



D以外の要因効果の差がわかる  
利得も相応な値

|    | 最適   | 最悪   | 利得   |
|----|------|------|------|
| 推定 | 77.8 | 37.2 | 40.6 |
| 確認 | 24.7 | 14.6 | 10.1 |

SN比 $\eta$ で $3db$  (デシベル) 差があるとは？

$$\eta_1 = 10 \log A_1$$

$$\eta_2 = 10 \log A_2$$

$$\begin{aligned} \eta_1 - \eta_2 &= 10 \log A_1 - 10 \log A_2 \\ &= 10 \log \frac{A_1}{A_2} = 3db \end{aligned}$$

$$\log \frac{A_1}{A_2} = \frac{3}{10} = 0.3$$

$$\frac{A_1}{A_2} = 10^{0.3} \doteq 2$$

真数 $A_1$ が $A_2$ の2倍の効果があるということ