

$$A : \mathbb{Z} \rightarrow \mathbb{Z}$$

$$A[\frac{1}{f}]$$

$A \rightarrow A[\frac{1}{f}]$ 自然写像

$$(5.31) \mathbb{Z} \rightarrow \mathbb{Z}[\frac{1}{5}] = \left\{ \frac{a}{5^k} \mid \begin{array}{l} a=1,2,3,\dots \\ k \in \mathbb{Z} \end{array} \right\}$$

$$A[\frac{1}{f}] \stackrel{\text{def}}{=} A[X] / (X \cdot f - 1)$$

$U_f = \text{Spec } A$ の open set

$$U_f = \{ \mathfrak{p} \in U \mid \underbrace{f \notin \mathfrak{p}} \}$$

↑ の正則関数 f の全体

$$A = \mathbb{Z}/6\mathbb{Z}, f=2$$

$$2 \cdot 3 = 0 \in \text{im } A$$

$$A[\frac{1}{f}] \text{ には } \text{im } A$$

$$\frac{1}{2} \cdot (2 \cdot 3) = 0 \quad \therefore 3 = 0$$

$$\mathbb{Z}/6\mathbb{Z} \rightarrow \mathbb{Z}/6\mathbb{Z}[\frac{1}{2}] \text{ 単射ではない}$$

$$\begin{array}{ccc} \mathbb{Z} & \xrightarrow{\quad} & \mathbb{Z} \\ 3 & \longmapsto & 0 \end{array}$$

$$A: \text{intg} \supset S$$

$$(S) = I \Rightarrow V(S) = V(I)$$

$$S \subset I \therefore V(S) \supset V(I)$$

$$\begin{aligned} V(I) &= \{ \mathfrak{p} \in \text{Spec} A \mid \text{eval}_{\mathfrak{p}} f = 0 \text{ for } \forall f \in I \} \\ &= \{ \mathfrak{p} \in \text{Spec} A \mid f \in \mathfrak{p} \text{ for } \forall f \in I \} \\ &= \{ \mathfrak{p} \in \text{Spec} A \mid I \subset \mathfrak{p} \} \\ &= \{ \mathfrak{p} \in \text{Spec} A \mid (S) \subset \mathfrak{p} \} \\ &= \{ \mathfrak{p} \in \text{Spec} A \mid S \subset \mathfrak{p} \} \\ &= V(S) \quad \square \end{aligned}$$

$$e_n = \frac{1}{n} (1 - T^n) \Big|_W \in \Lambda(A)$$

中等 $\rightarrow \Lambda(A)$ の直積分解

$$\Lambda(A) \simeq \underbrace{e_n \Lambda(A)} \times \underbrace{(1 - e_n) \Lambda(A)}$$

$$e_n \Lambda(A) = \frac{1}{n} (1 - T^n) \Big|_W \cdot (P(T)) \Big|_W \\ \subset [1 + T^n A][[T^n]]$$

exercise 13.A

$$e_n \cdot (P(T^n)) \Big|_W = (P(T^n)) \Big|_W$$

$$e_n \Lambda(A) = \text{Image } V_n \simeq \Lambda(A)$$

