

$$c_2(\xi, \theta, \phi, \varepsilon) \in \mathbb{R}(4)$$

$$[c_2(\xi, \theta, \phi, \varepsilon)](1) = \xi(1) + \varepsilon \sin(\theta) \cos(\phi)$$

$$[c_2(\xi, \theta, \phi, \varepsilon)](2) = \xi(2)$$

$$[c_2(\xi, \theta, \phi, \varepsilon)](3) = \xi(3) + \varepsilon \sin(\theta) \sin(\phi)$$

$$[c_2(\xi, \theta, \phi, \varepsilon)](4) = \xi(4) + \varepsilon \cos(\theta)$$

$$c_3(\xi, \theta, \phi, \varepsilon) \in \mathbb{R}(4)$$

$$[c_3(\xi, \theta, \phi, \varepsilon)](1) = \xi(1) + \varepsilon \sin(\theta) \cos(\phi)$$

$$[c_3(\xi, \theta, \phi, \varepsilon)](2) = \xi(2) + \varepsilon \sin(\theta) \sin(\phi)$$

$$[c_3(\xi, \theta, \phi, \varepsilon)](3) = \xi(3)$$

$$[c_3(\xi, \theta, \phi, \varepsilon)](4) = \xi(4) + \varepsilon \cos(\theta)$$

$$c_4(\xi, \theta, \phi, \varepsilon) \in \mathbb{R}(4)$$

$$[c_4(\xi, \theta, \phi, \varepsilon)](1) = \xi(1) + \varepsilon \sin(\theta) \cos(\phi)$$

$$[c_4(\xi, \theta, \phi, \varepsilon)](2) = \xi(2) + \varepsilon \sin(\theta) \sin(\phi)$$

$$[c_4(\xi, \theta, \phi, \varepsilon)](3) = \xi(3) + \varepsilon \cos(\theta)$$

$$[c_4(\xi, \theta, \phi, \varepsilon)](4) = \xi(4)$$

$$\sigma \in [\mathbb{R}(\mathbb{R}(\{4\})) \times \mathbb{R}] \mapsto \{-1, 0, +1\}$$

$$\forall z \in \mathbb{R}(\mathbb{R}(\{4\})); \forall t \in \mathbb{R}(\{4\}); \text{【1】 and 【2】 and 【3】}$$

$$\text{【1】 } [\exists n \in \mathbb{N}; [\forall k \in \mathbb{N}; k < 2n - 1 \Rightarrow (\partial_4)^k z(t) = 0]$$

$$\text{and } (\partial_4)^{2n-1} z(t) > 0] \Rightarrow \sigma(z, t(4)) = +1$$

$$\text{【2】 } [\exists n \in \mathbb{N}; [\forall k \in \mathbb{N}; k < 2n - 1 \Rightarrow (\partial_4)^k z(t) = 0]$$

$$\text{and } (\partial_4)^{2n-1} z(t) < 0] \Rightarrow \sigma(z, t(4)) = -1$$

$$\text{【3】 } [\exists n \in \mathbb{N}; [\forall k \in \mathbb{N}; k < 2n \Rightarrow (\partial_4)^k z(t) = 0]$$

$$\text{and } (\partial_4)^{2n} z(t) \neq 0] \Rightarrow \sigma(z, t(4)) = 0$$

とする。また、

$\forall x \in \mathbb{R}(3); \delta(x(1)) \delta(x(2)) \delta(x(3))$ を $\delta(x)$ と略記することがある。