

0.1 The Identity Substitution on Effect Environments

For each type environment Φ , define the identity substitution I_Φ as so:

- $I_\diamond = \diamond$
- $I_{(\Phi, \alpha)} = (I_\Phi, \alpha := \alpha)$

0.1.1 Properties of the Identity Substitution

Property 1 If $\Phi \mathbf{Ok}$ then $\Phi \vdash I_\Phi : \Phi$, proved trivially by induction over the \mathbf{Ok} relation.

Property 2 **TODO:** The denotational property of id-substitution

0.2 Single Substitution on Effect Environments

If $\Phi \vdash \epsilon$, let the single substitution $\Phi \vdash [\epsilon/\alpha] : \Phi, \alpha$, be defined as:

$$[x/\alpha] = (I_\Phi, \alpha := \epsilon) \tag{1}$$