A New rules added to DTS

A.1 Structural rules of CMTT

$$(hyp)\ \frac{\Delta\ ;\ (\Gamma, x : A, \Gamma')}{x : A} \qquad (ctxhyp)\ \frac{\begin{array}{c} u :: A[\Psi] \\ \vdots \\ \sigma : \Psi \end{array}}{\mathtt{clo}(u, \sigma) : A}$$

A.2 Rules for $\Diamond$

$$(\Diamond F), i\ \frac{\begin{array}{cc} & \overline{\Psi}^{\ i} \\ \Psi\ \mathsf{context} & \vdots \\ & M : \mathsf{type} \end{array}}{\langle\Psi\rangle M : \mathsf{type}} \qquad (\Diamond I)\ \frac{E : A\ \mathsf{poss}\ \langle\Psi\rangle}{\mathtt{dia}(E) : \langle\Psi\rangle A} \qquad (\Diamond E), i\ \frac{\begin{array}{cc} & \overline{\Psi}^{\ i} \quad \overline{x : A}^{\ i} \\ M : \langle\Psi\rangle A & \vdots \\ & E : B\ \mathsf{poss}\ \langle\Theta\rangle \end{array}}{\mathtt{letdia}(M, \langle\Psi, x\rangle.E) : B\ \mathsf{poss}\ \langle\Theta\rangle}$$

A.3 Rules for $\Box$

$$(\Box F), i\ \frac{\begin{array}{cc} & \overline{\Psi}^{\ i} \\ \Psi\ \mathsf{context} & \vdots \\ & M : \mathsf{type} \end{array}}{[\Psi]M : \mathsf{type}} \qquad (\Box I), i\ \frac{\begin{array}{c} \overline{\Psi}^{\ i} \\ \vdots \\ M : A \end{array}}{\mathtt{box}(\Psi.M) : [\Psi]A} \qquad (\Box E), i\ \frac{\begin{array}{cc} & \overline{u :: A[\Psi]}^{\ i} \\ M : [\Psi]A & \vdots \\ & N : C \end{array}}{\mathtt{letbox}(M, u.N) : C}$$

A.4 Rules for poss

$$(\mathsf{poss}F), i\ \frac{\begin{array}{cc} & \overline{\sigma : \Psi}^{\ i} \\ \sigma : \Psi\ \mathsf{context} & \vdots \\ & M : \mathsf{type} \end{array}}{M\ \mathsf{poss}\ \langle\Psi\rangle : \mathsf{type}} \qquad (\mathsf{poss}I)\ \frac{\sigma : \Psi \quad M : A}{\langle\sigma, M\rangle : A\ \mathsf{poss}\ \langle\Psi\rangle} \qquad (\mathsf{poss}E)\ \frac{M : A\ \mathsf{poss}\ \langle\sigma : \Psi\rangle}{\mathtt{p2}(M) : A}\ (\ \sigma \in fv(M)\ )$$