SET171+3 $\forall X_o$; Y_o ; Z_o : X (Y Z) = (X Y) (X Z)
SET611+3 $\forall X_o$; Y_o :(X

Assumptions:	$\forall B;C;x.[x \in (B \quad C) \quad x \in B \quad x \in C]$	(1)
	$\forall B;C;x.[x \in (B \quad C) \quad x \in B \,/\, x \in C]$	(2)
	$\forall B;C\ [B = C \quad B \subseteq C \,/\, C \subseteq B]$	(3)
	$\forall B;C\ [B \quad C = C \quad B]$	(4)
	$\forall B;C\ [B \quad C = C \quad B]$	(5)
	$\forall B;C\ [B \subseteq C \quad \forall x.x \in B \quad x \in C]$	(6)
	$\forall B;C\ [B = C \quad \forall x.x \in B \quad x \in C]$	(7)
Proof Goal:	$\forall B;C;D\ [B \quad (C \quad D) = (B \quad C) \quad (B \quad D)]$	(8)

Table 3. SET171+3: The First-Order TPTP En/BPC 1 ID EI (4)

(1) ¬∀B; C; D:B (C D) = (B C) (B D)	
	clause initialization def.-expansion, cnf B; C; D Skolem const.
(2) [(x:Bx (Cx / Dx)) = (x:(Bx / Cx) (Cx / Dx))]^F	
	uni cation constraint
(3) [(x:Bx (Cx / Dx)) =$^?$(x:(Bx / Cx) (Cx / Dx))]	
	f-extensionality x new Skolem constant
(4) [(Bx (Cx / Dx)) =$^?$((Bx / Cx) (Cx / Dx))]	
	B-extensionality
(5) [(Bx (Cx / Dx)) ((Bx / Cx) (Cx / Dx))]^F	
	cnf, factor., subsumption
(6) [Bx]^F	
(7) [Bx]^T [Cx]^T	propositional problem!
(8) [Bx]^T [Dx]^T	
(9) [Cx]^F [Dx]^F	
	propositional reasoning
(10)	

Table 4. Problem SET171+3: Solution in LEO

For the experiments with Leo and the cooperation of Leo with the rst-order theorem prover Bliksem, -abstraction as well as the exsionalit y treatment inherent in Leo's calculus [4] is used. This enables a theoret79778y Henkin-complete proof system for set theory. In the above example SET171+3, Leo gen-era78yuses the application of functional exsionalit y to push uni - cation constraints down to base t t

Some problems are immediately mapped by recursive de nition expansion (without extensionality reasoning) and normalisation into the empty clause such that proof search does not even start; an example is SET646+3. Some problems require several rounds of extensionality processing within Leo's set-of-support based proof search procedure before the bag of rst-order like clauses turns into a refutable ing systems such as automated theorem provers, computer algebra systems, or model generators into the architecture.

3.1 Cooperation via multiple inference rules

The use of the external systems is modelled by inference

3.2 Cooperation via a single inference rule

In order to overcome the problem

layer of the ants blackboard architecture. This is not an ad hoc solution, but

{ When the above suggestion of a successful joint proof attempt is