`C:/Users/torsten/GitHub/colore/ontologies/multidim_space_codi/codi_down.clif`

1. $\forall x\ \forall y\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \mathrm{S}(y) \wedge \neg\ \big(\mathrm{C}(x, y)\big)\Big) \leftrightarrow \mathrm{ZEX}(\mathrm{intersection}(x, y))\Big]\Big]$
2. $\forall x\ \forall y\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \mathrm{S}(y) \wedge \neg\ \big(\mathrm{ZEX}(\mathrm{intersection}(x, y))\big)\Big) \rightarrow \mathrm{Cont}(\mathrm{intersection}(x, y), x)\Big]\Big]$
3. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{Cont}(z, x) \wedge \mathrm{Cont}(z, y)\big) \rightarrow \mathrm{leq}(z, \mathrm{intersection}(x, y))\Big]\Big]$
4. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{Cont}(z, x) \wedge \mathrm{Cont}(z, y) \wedge \mathrm{EqDim}(z, \mathrm{intersection}(x, y))\big) \leftrightarrow \mathrm{P}(z, \mathrm{intersection}(x, y))\Big]\Big]$
5. $\forall x\ \forall y\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \mathrm{S}(y) \wedge \neg\ \big(\mathrm{ZEX}(\mathrm{difference}(x, y))\big)\Big) \rightarrow \mathrm{EqDim}(x, \mathrm{difference}(x, y))\Big]\Big]$
6. $\forall x\ \forall y\ \Big[\big[\mathrm{lt}(y, x) \rightarrow =(x, \mathrm{difference}(x, y))\big]\Big]$
7. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x, y) \wedge \mathrm{Cont}(z, x) \wedge \mathrm{lt}(\mathrm{intersection}(z, y), z)\big) \rightarrow \mathrm{Cont}(z, \mathrm{difference}(x, y))\Big]\Big]$
8. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x, y) \wedge \mathrm{Cont}(z, \mathrm{difference}(x, y))\big) \rightarrow \mathrm{Cont}(z, x)\Big]\Big]$
9. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x, y) \wedge \mathrm{P}(z, \mathrm{difference}(x, y))\big) \rightarrow \mathrm{lt}(\mathrm{intersection}(z, y), z)\Big]\Big]$
10. $\forall x\ \forall y\ \Big[\Big[\mathrm{ZEX}(\mathrm{difference}(x, y)) \leftrightarrow \big(\mathrm{ZEX}(x) \vee \mathrm{Cont}(x, y)\big)\Big]\Big]$
11. $\forall x\ \forall y\ \Big[\Big[\mathrm{C}(x, y) \leftrightarrow \exists z\ \Big[\big(\mathrm{Cont}(z, x) \wedge \mathrm{Cont}(z, y)\big)\Big]\Big]\Big]$
12. $\forall x\ \Big[\Big[\Big(\mathrm{S}(x) \wedge \neg\ \big(\mathrm{ZEX}(x)\big)\Big) \leftrightarrow \mathrm{Cont}(x, x)\Big]\Big]$
13. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{Cont}(x, y) \wedge \mathrm{Cont}(y, x)\big) \rightarrow =(x, y)\Big]\Big]$
14. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{Cont}(x, y) \wedge \mathrm{Cont}(y, z)\big) \rightarrow \mathrm{Cont}(x, z)\Big]\Big]$
15. $\forall x\ \forall y\ \Big[\Big[\mathrm{ZEX}(x) \rightarrow \Big(\mathrm{S}(x) \wedge \neg\ \big(\mathrm{Cont}(y, x)\big) \wedge \neg\ \big(\mathrm{Cont}(x, y)\big)\Big)\Big]\Big]$

16. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{ZEX}(x) \wedge \mathrm{ZEX}(y)\big) \rightarrow =(x, y)\Big]\Big]$

17. $\forall x\ \forall y\ \Big[\big[\mathrm{gt}(x, y) \leftrightarrow \mathrm{lt}(y, x)\big]\Big]$

18. $\forall x\ \forall y\ \Big[\big[\mathrm{geq}(x, y) \leftrightarrow \mathrm{leq}(y, x)\big]\Big]$

19. $\forall x\ \forall y\ \Big[\Big[\mathrm{lt}(x, y) \leftrightarrow \Big(\mathrm{leq}(x, y) \wedge \neg\big(\mathrm{EqDim}(x, y)\big)\Big)\Big]\Big]$

20. $\forall x\ \forall y\ \Big[\Big[\mathrm{EqDim}(x, y) \leftrightarrow \big(\mathrm{leq}(x, y) \wedge \mathrm{leq}(y, x)\big)\Big]\Big]$

21. $\forall x\ \forall y\ \Big[\big[\mathrm{leq}(x, y) \rightarrow \mathrm{S}(x)\big]\Big]$

22. $\forall x\ \forall y\ \Big[\big[\mathrm{leq}(x, y) \rightarrow \mathrm{S}(y)\big]\Big]$

23. $\forall x\ \Big[\big[\mathrm{ZEX}(x) \rightarrow \mathrm{S}(x)\big]\Big]$

24. $\forall x\ \Big[\big[\mathrm{S}(x) \rightarrow \mathrm{leq}(x, x)\big]\Big]$

25. $\forall x\ \forall y\ \forall z\ \Big[\Big[\big(\mathrm{leq}(x, y) \wedge \mathrm{leq}(y, z)\big) \rightarrow \mathrm{leq}(x, z)\Big]\Big]$

26. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{ZEX}(x) \wedge \mathrm{ZEX}(y)\big) \rightarrow =(x, y)\Big]\Big]$

27. $\forall x\ \forall y\ \Big[\Big[\big(\mathrm{ZEX}(x) \wedge \mathrm{S}(y)\big) \rightarrow \mathrm{leq}(x, y)\Big]\Big]$

28. $\forall x\ \forall y\ \Big[\Big[\mathrm{P}(x, y) \leftrightarrow \big(\mathrm{Cont}(x, y) \wedge \mathrm{EqDim}(x, y)\big)\Big]\Big]$

29. $\forall x\ \forall y\ \Big[\big[\mathrm{Cont}(x, y) \rightarrow \mathrm{leq}(x, y)\big]\Big]$

30. $\exists x\ \big[\mathrm{MinDim}(x)\big]$

31. $\forall x\ \Big[\Big[\mathrm{MaxDim}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big) \wedge \forall y\ \Big[\big[\mathrm{S}(y) \rightarrow \mathrm{leq}(y, x)\big]\Big]\Big)\Big]\Big]$

32. $\forall x\ \Big[\Big[\mathrm{MinDim}(x) \leftrightarrow \Big(\mathrm{S}(x) \wedge \neg\big(\mathrm{ZEX}(x)\big) \wedge \forall y\ \Big[\Big[\Big(\mathrm{S}(y) \wedge \neg\big(\mathrm{ZEX}(y)\big)\Big) \rightarrow \mathrm{leq}(x, y)\Big]\Big]\Big)\Big]\Big]$