Refutation of descriptive unions in descriptively near sets

Abstract: We evaluate an intersection operator named descriptive union for descriptively near sets. A proof of seven properties contains two trivial tautologies and the rest as *no*t tautologous. The refutes the descriptive intersection operator and descriptively near sets on which it is based. This also casts doubt on the derived slug of math and physics papers as spawned at archiv, researchgate, and vixra.

We assume the method and apparatus of Meth8/VŁ4 with Tautology as the designated *proof* value, **F** as contradiction, N as truthity (non-contingency), and C as falsity (contingency). For results, the 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables. (See ersatz-systems.com.)

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LET   p, q, r, s, t, u, v, w, x, y, z:
      lc_phi φ, uc_Phi Φ, A, B, lc_pi π, K, R^n, 2^K, x, y, (q&(r&s));
      ~ Not, ¬ ;  + Or, ∨, ∪;  - Not Or;  & And, ∧, ∩;  \ Not And;
      > Imply, greater than, →, ⊢, ↦;  < Not Imply, less than, ∈;
      = Equivalent, ≡, ⊨, :=, ⟺, ↔;  @ Not Equivalent, ≠;
      % possibility, for one or some, ∃, ◊, M;  # necessity, for every or all, ∀, □, L;
      (z=z) T as tautology; (z@z) F as contradiction, ∉;
      (%z<#z) C as contingency, Δ, ordinal 1;
      (%z>#z) N as non-contingency, ∇, ordinal 2;
      ~( y < x) ( x ≤ y), ( x ⊆y).
```

From: Ahmad, M.Z.; Peters, J.F. (2018).
Descriptive unions: a fibre bundle characterization of the union of descriptively near sets.
arxiv.org/pdf/1811.11129.pdf   ahmadmz@myumanitoba.ca   james.peters3@umanitoba.ca

Definition 3: ... $\cap_{\Phi}$ is the descriptive intersection. ...

Theorem 1. Let A,B ⊂K be two subsets of a set K,φ : 2K → Rn be the probe function and π : Rn → 2K be a map such that π : x ↦{y ∈K : φ(y) = x}. Then, A $\cap_{\Phi}$ B has [the] following properties: (1.0.1)

```
((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))) ;
        FFFF FFFF FFFF FFTT( 4), FTFT FTFT FTFT FFTT( 3),
        TFTF TFTF TFTF FFTT( 3), TTTT TTTT TTTT TTTT( 4),
        FTFT FTFT FTFT FTTT( 1), TFTF TFTF TFTF TFTT( 1)     (1.0.2)
```

Note: Eq. 1.0.2 as rendered serves as antecedent to the 1.n.2 consequents listed below.

1.10   A $\cap_{\Phi}$ B = A $\cap_{\Phi}$ B. (1.1.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>(z=z) ;
                        TTTT TTTT TTTT TTTT(16)     (1.1.2)
```

Remark 1.1.2: Eq. 1.1.1 is trivial with this result to be expected.

1.20 $A = \emptyset \Rightarrow A \Cap_{\Phi} B = \{x \in B : \varphi(x) = \varphi(\emptyset)\}$. (1.2.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>(((r=(z@z))>z)=((x<s)=((p&x)=(p&(z@z))))) ;
              TFTF TFTF TTTT TTFT( 4), TTTT TTTT FTFT TTFT( 4),
              TFTF TFTF FTFT FTFT( 4), TTTT TTTT TTTT TTFT( 4)
```
(1.2.2)

1.30 $A = B \Rightarrow A \Cap_{\Phi} B = A$. (1.3.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>((r=s)>(z=r)) ;
              TFTF TTTT TTTT TTTT( 4), FTFT TTTT TTTT TTTT( 4),
              FFFF TTTT TTTT TTTT( 4), TTTT TTTT TTTT TTTT( 4)
```
(1.3.2)

1.40 $A \cap B \Rightarrow A \Cap_{\Phi} B$. (1.4.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>((r&s)>z) ;          TTTT TTTT TTTT TTTT(16)
```
(1.4.2)

Remark 1.4.2: Eq. 1.4.1 is trivial with this result to be expected.

1.50 $A \Cap_{\Phi} B \neq A \cap B$. (1.5.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>~(z>(r&s)) ;
              TTTT TTTT TTTT TTFF(10), TTTT TTTT TTTT FFFF( 4),
              TTTT TTTT TTTT TFFF( 1), TTTT TTTT TTTT FTFF( 1)
```
(1.5.2)

1.60 $(A \Cap_{\Phi} B = A \cap B) \Leftrightarrow \varphi$ is an injective function. (1.6.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>((z=(r&s))=p) ;
              TFTF TFTF TFTF TTFT( 4), TTTT TTTT TTTT TTFT( 8),
              TFTF TFTF TFTF FTFT( 4)
```
(1.6.2)

1.70 $A \Cap_{\Phi} B \subseteq A \cup B$. (1.7.1)

```
(((((r<u)&(s<u))>((p=(w>v))&(t=(v>w))))>(t=(x>((y<u)>((p&y)=x)))))
>(z=(q&(r&s))))>~((r+s)<z) ;
              TTTT FFFF FFFF FFTT(43), TTTT FFFF FFFF FFFF(16),
              TTTT FFFF FFFF FFTF( 4), TTTT FFFF FFFF FFFT( 1),
              TTTT TTTT TTTT TTTT(64)
```
(1.7.2)

A set intersection operator was proposed for descriptively near sets and named descriptive union. In the Theorem 1 proof seven properties are listed: two are trivial tautologies; and five as rendered are *no*t tautologous. The refutes descriptive intersection operators and near sets on which it is based.