

Theorems about the space-time

Fundamental Theorem of the fixation of the future (First Velleca's Theorem)

Let F future. Then:

- 1) F not fixed $\Leftrightarrow F$ revealed
- 2) F fixed $\Leftrightarrow F$ not revealed

Definitions about the space-time and about the future

Let F future and S space-time Then:

F exists $\Leftrightarrow F$ fixed

F doesn't exist $\Leftrightarrow F$ not fixed

S continuos $\Leftrightarrow F$ fixed

S discontinuos $\Leftrightarrow F$ not fixed

S darked $\Leftrightarrow F$ not revealed

S illuminated $\Leftrightarrow F$ revealed

Criterion of existence of the future (Second Velleca's Theorem)

Let F future. Then the following are equivalent:

- 1) F doesn't exist
- 2) F not fixed
- 3) F revealed

Dem.

F doesn't exist $\Leftrightarrow F$ not fixed $\Leftrightarrow$ (First Velleca's Theorem) F revealed

Second Criterion of existence of the future (Third Velleca's Theorem)

Let F future. Then the following are equivalent:

- 1) F exist
- 2) F fixed
- 3) F not revealed

Dem.

F exist $\Leftrightarrow F$ fixed $\Leftrightarrow$ (First Velleca's Theorem) F not revealed

Theorem of truth of the law of big numbers (Fourth Velleca's Theorem)

Let F future. Then:

- 1) *The law of big numbers is true $\Leftrightarrow F$ not fixed*
- 2) *The law of big numbers is fake $\Leftrightarrow F$ fixed*

Dem.

1) $\Rightarrow$

*For absurd F fixed $\Rightarrow \exists P_1, \dots, P_n \in F$ points : $P_1, \dots, P_n$ fixed =
> The law of big numbers is fake (Absurd)*

So the law of big numbers is true

$\Leftarrow$

F not fixed $\Rightarrow \exists P_1, \dots, P_n \in F$ points : $P_1, \dots, P_n$ not fixed $\Rightarrow$ The law of big numbers is true

2) $\Rightarrow$

*(F not fixed $\Rightarrow$ The law of big numbers is true) =
> (The law of big numbers is fake $\Rightarrow F$ fixed)*

$\Leftarrow$

*(The law of big numbers is true $\Rightarrow F$ not fixed) $\Rightarrow$ (F fixed =
> The law of big numbers is fake)*

First Velleca's Characterization

Let F future and S space-time. Then the following are equivalent

- 1) *S continuous*
- 2) *S darked*
- 3) *The law of big numbers is fake*
- 4) *F exists*
- 5) *F fixed*
- 6) *F not revealed*

Dem.

1) $\Rightarrow$ 2)

S continuos $\Rightarrow$ F fixed $\Rightarrow$ F not revealed $\Rightarrow$ S darked

2) $\Rightarrow$ 3)

S darked $\Rightarrow$ F not revealed $\Rightarrow$ F fixed $\Rightarrow$ The law of big numbers is fake

3) $\Rightarrow$ 4)

The law of big numbers is fake $\Rightarrow$ F fixed $\Rightarrow$ F exists

4) $\Rightarrow$ 5)

F exists $\Rightarrow$ F fixed

5) $\Rightarrow$ 6)

F fixed $\Rightarrow$ F not revealed

6) $\Rightarrow$ 1)

F not revealed $\Rightarrow$ F fixed $\Rightarrow$ S continuos

Second Velleca's Characterization

Let F future and S space-time. Then the following are equivalent

1) *S discontinuos*

2) *S illuminated*

3) *The lay of big numbers is true*

4) *F doesn't exist*

5) *F not fixed*

6) *F revealed*

Dem.

1) $\Rightarrow$ 2)

$S \text{ discontinuos} \Rightarrow F \text{ not fixed} \Rightarrow F \text{ revealed} \Rightarrow S \text{ illuminated}$

2) $\Rightarrow$ 3)

$S \text{ illuminated} \Rightarrow F \text{ revealed} \Rightarrow F \text{ not fixed} \Rightarrow \text{The law of big numbers is true}$

3) $\Rightarrow$ 4)

$\text{The law of big numbers is true} \Rightarrow F \text{ not fixed} \Rightarrow F \text{ doesn't exist}$

4) $\Rightarrow$ 5)

$F \text{ doesn't exist} \Rightarrow F \text{ not fixed}$

5) $\Rightarrow$ 6)

$F \text{ not fixed} \Rightarrow F \text{ revealed}$

6) $\Rightarrow$ 1)

$F \text{ revealed} \Rightarrow F \text{ not fixed} \Rightarrow S \text{ discontinuos}$

Einstein's Space-Time and Heinsberg's Space-Time

Let S Space-time. Then:

$S \text{ is Einstein's} \Leftrightarrow S = \{x: x \text{ fixed future event}\}$

$S \text{ is Heinsberg's} \Leftrightarrow S = \{x: x \text{ not fixed future event}\}$

Fifth Velleca's Theorem

Let S space-time. Then:

$S \text{ is Einstein's} \Leftrightarrow S = \{x: x \text{ not revealed future event}\}$

$S \text{ is Heinsberg's} \Leftrightarrow S = \{x: x \text{ revealed future event}\}$

Dem.

$S \text{ is Einstein's} \Leftrightarrow S = \{x: x \text{ fixed future event}\}$

$= \{x: x \text{ not revealed future event}\} \text{ for First Velleca's Theorem} \Leftrightarrow S$

$= \{x: x \text{ not revealed future event}\}$

$S \text{ is Heinsberg's} \Leftrightarrow S = \{x: x \text{ not fixed future event}\}$

$= \{x: x \text{ revealed future event}\} \text{ for First Velleca's Theorem} \Leftrightarrow S$

$= \{x: x \text{ revealed future event}\}$

Velleca's Space-Time

Let S_E Einstein's space – time and S_H Heinsberg's space – time. Then:

$$S_V = S_E \cup S_H$$

Dem.

$$S_E \cup S_H = \{x: x \text{ not revealed future event}\} \cup \{x: x \text{ revealed future event}\} = \{x: x \text{ not revealed future event or } x \text{ revealed future event}\} = S_V \Rightarrow S_V = S_E \cup S_H$$

Velleca's Space-Time

Let S space-time. Then:

$$S \text{ is Velleca's } \Leftrightarrow S = \{x: x \text{ not revealed future event or } x \text{ revealed future event}\}$$

Dem.

$\Rightarrow$

$$S \text{ is Velleca's } \Rightarrow S = S_E \cup S_H = \{x: x \text{ not revealed future event}\} \cup \{x: x \text{ revealed future event}\} = \{x: x \text{ not revealed future event or } x \text{ revealed future event}\} \Rightarrow$$

$$S = \{x: x \text{ not revealed future event or } x \text{ revealed future event}\}$$

$\Leftarrow$

$$S = \{x: x \text{ not revealed future event or } x \text{ revealed future event}\} \Rightarrow$$

$$S = \{x: x \text{ not revealed future event}\} \cup \{x: x \text{ revealed future event}\} = S_E \cup S_H \Rightarrow S = S_E \cup S_H \Rightarrow$$

$$S \text{ is Velleca's}$$

Theorem of Einstein's space-time (Sixth Velleca's Theorem)

Let S space-time. Then the following are equivalent:

- 1) S is Einstein's
- 2) F not revealed $\forall F$
- 3) First Velleca's Characterization is true

Dem.

$$S \text{ is Einstein's } \Leftrightarrow S = \{x: x \text{ not revealed future event}\} \Leftarrow$$
$$> x \text{ not revealed future event } \forall x$$

$$\Leftrightarrow F \text{ not revealed } \forall F \Leftrightarrow \text{First Velleca's Characterization is true}$$

Theorem of Heinsberg's space-time (Seventh Velleca's Theorem)

Let S space-time. Then the following are equivalent:

- 1) S is Heinsberg's
- 2) F revealed $\forall F$
- 3) Second Velleca's Characterization is true

Dem.

S is Heinsberg's $\Leftrightarrow S = \{x: x \text{ revealed future event}\} \Leftrightarrow x \text{ revealed future event } \forall x$
 $\Leftrightarrow F \text{ revealed } \forall F \Leftrightarrow$
 $> \text{ Second Velleca's Characterization is true}$

Theorem of Velleca's space-time (Theorem of the totality)

Let S space-time. Then the following are equivalent:

- 1) S is Velleca's
- 2) $\forall F: F \text{ not revealed or } F \text{ revealed}$
- 3) First Velleca's Characterization is true or Second Velleca's Characterization is true
- 4) S is Einstein's or S is Heinsberg's

Dem.

S is Velleca's $\Leftrightarrow S = \{x: x \text{ not revealed future event or } x \text{ revealed future event}\}$
 $\Leftrightarrow x \text{ not revealed future event } \forall x \text{ or } x \text{ revealed future event } \forall x \Leftrightarrow$
 $F \text{ not revealed } \forall F \text{ or } F \text{ revealed } \forall F \Leftrightarrow \forall F: F \text{ not revealed or } F \text{ revealed}$
 $\Leftrightarrow \text{ First Velleca's Characterization is true or Second Velleca's Characterization is true}$
 $\Leftrightarrow S \text{ is Einstein's or } S \text{ is Heinsberg's}$

Theorem of Einstein's space-time (Eighth Velleca's Theorem)

Let S space-time, and F future. Then the following are equivalent:

- 1) $\exists! S: S \text{ is Einstein's}$
- 2) $\exists! S: S = \{x: x \text{ not revealed future event, } x \text{ fixed future event}\}$
- 3) $\exists! S: S \text{ continuous}$
- 4) $\exists! S: S \text{ darked}$
- 5) $\forall F: F \text{ not revealed}$
- 6) $\forall F: F \text{ fixed}$
- 7) $\forall F: \exists F$
- 8) The law of big numbers is fake

Dem.

1) $\Rightarrow$ 2)

S is Einstein's $\Rightarrow S = \{x: x \text{ not revealed future event}\} \Rightarrow x \text{ not revealed future event } \forall x$
 $\Rightarrow x \text{ fixed future event } \forall x$ for First Velleca's Theorem $\Rightarrow$
 $x \text{ not revealed future event } \forall x, x \text{ fixed future event } \forall x \Rightarrow$
 $\forall x: x \text{ not revealed future event}, x \text{ fixed future event} \Rightarrow$
 $S = \{x: x \text{ not revealed future event}, x \text{ fixed future event}\}$

2) $\Rightarrow$ 3)

$S = \{x: x \text{ not revealed future event}, x \text{ fixed future event}\} \Rightarrow$
 $\forall x: x \text{ not revealed future event}, x \text{ fixed future event} \Rightarrow$
 $\forall x: x \text{ fixed future event} \Rightarrow F \text{ fixed } \forall F \Rightarrow \forall F: F \text{ fixed} \Rightarrow \exists! S: S \text{ continuos}$

3) $\Rightarrow$ 4)

$\exists! S: S \text{ continuos} \Rightarrow \forall F: F \text{ fixed} \Rightarrow \forall F: F \text{ not revealed} \Rightarrow \exists! S: S \text{ darked}$

4) $\Rightarrow$ 5)

$\exists! S: S \text{ darked} \Rightarrow \forall F: F \text{ not revealed}$

5) $\Rightarrow$ 6)

$\forall F: F \text{ not revealed} \Rightarrow \forall F: F \text{ fixed}$

6) $\Rightarrow$ 7)

$\forall F: F \text{ fixed} \Rightarrow \forall F: \exists F$

7) $\Rightarrow$ 8)

$\forall F: \exists F \Rightarrow \forall F: F \text{ fixed} \Rightarrow \text{The law of big numbers is fake}$

8) $\Rightarrow$ 1)

$\text{The law of big numbers is fake} \Rightarrow \forall F: F \text{ fixed} \Rightarrow x \text{ fixed future event } \forall x \Rightarrow$
 $S = \{x: x \text{ fixed future event}\} \Rightarrow S \text{ is Einstein's}$

Theorem of Heinsberg's space-time (nineth Velleca's Theorem)

Let S space-time, and F future. Then the following are equivalent:

- 1) $\exists! S: S$ is Heinsberg's
- 2) $\exists! S: S = \{x: x \text{ revealed future event}, x \text{ not fixed future event}\}$
- 3) $\exists! S: S$ discontinuos
- 4) $\exists! S: S$ illuminated
- 5) $\forall F: F$ revealed
- 6) $\forall F: F$ not fixed
- 7) $\forall F: \nexists F$
- 8) The law of big numbers is true

Dem.

1) $\Rightarrow$ 2)

$\exists! S: S$ is Heinsberg's $\Rightarrow S = \{x: x \text{ revealed future event}\} \Rightarrow x \text{ revealed future event } \forall x$
 $\Rightarrow x \text{ not fixed future event } \forall x$ for First Velleca's Theorem $\Rightarrow$
 $x \text{ revealed future event } \forall x, x \text{ not fixed future event } \forall x \Rightarrow$
 $\forall x: x \text{ revealed future event}, x \text{ not fixed future event} \Rightarrow$
 $S = \{x: x \text{ revealed future event}, x \text{ not fixed future event}\}$

2) $\Rightarrow$ 3)

$S = \{x: x \text{ revealed future event}, x \text{ not fixed future event}\} \Rightarrow$
 $\forall x: x \text{ revealed future event}, x \text{ not fixed future event} \Rightarrow$
 $\forall x: x \text{ not fixed future event} \Rightarrow F \text{ not fixed } \forall F \Rightarrow \forall F: F \text{ not fixed} \Rightarrow \exists! S: S \text{ discontinuos}$

3) $\Rightarrow$ 4)

$\exists! S: S \text{ discontinuos} \Rightarrow \forall F: F \text{ not fixed} \Rightarrow \forall F: F \text{ revealed} \Rightarrow \exists! S: S \text{ illuminated}$

4) $\Rightarrow$ 5)

$\exists! S: S \text{ illuminated} \Rightarrow \forall F: F \text{ revealed}$

5) $\Rightarrow$ 6)

$\forall F: F \text{ revealed} \Rightarrow \forall F: F \text{ not fixed}$

6) $\Rightarrow$ 7)

$\forall F: F \text{ not fixed} \Rightarrow \forall F: \nexists F$

7) $\Rightarrow$ 8)

$\forall F: \nexists F \Rightarrow \forall F: F \text{ not fixed} \Rightarrow \text{The law of big numbers is fake}$

8) $\Rightarrow$ 1)

The law of big numbers is true $\Rightarrow \forall F: F \text{ not fixed} \Rightarrow x \text{ fixed future event } \forall x \Rightarrow$

$S = \{x: x \text{ not fixed future event}\} \Rightarrow S \text{ is Heinsberg's}$

Theorem of Velleca's space-time (Tenth Velleca's Theorem)

Let S space-time and F future. Then the following are equivalent:

1) $\exists! S: S \text{ is Velleca's}$

2) $\exists! S: S = S_E \cup S_H$

3) $\exists! S: S = \{x: (x \text{ not revealed future event}, x \text{ fixed future event}) \vee (x \text{ revealed future event}, x \text{ not fixed future event})\}$

4) $\exists! S: S \text{ continuos } \vee S \text{ discontinuos}$

5) $\exists! S: S \text{ darked } \vee S \text{ illuminated}$

6) $\exists! S: S \text{ is Einstein's } \vee S \text{ is Heinsberg's}$

7) $\forall F: F \text{ not revealed } \vee F \text{ revealed}$

8) $\forall F: F \text{ fixed } \vee F \text{ not fixed}$

9) $\forall F: \exists F \vee \nexists F$

10) *The law of big numbers is fake $\vee$ The law of big numbers is true*

Dem.

1) $\Rightarrow$ 2)

$\exists! S: S \text{ is Velleca's} \Rightarrow S = S_E \cup S_H$

2) $\Rightarrow$ 3)

$\exists! S: S = S_E \cup S_H = \{x: x \text{ not revealed future event}, x \text{ fixed future event}\} \cup \{x: x \text{ revealed future event}, x \text{ not fixed future event}\} =$

$\{x: (x \text{ not revealed future event}, x \text{ fixed future event}) \vee (x \text{ revealed future event}, x \text{ not fixed future event})\}$

3) $\Rightarrow$ 4)

$S = \{x: (x \text{ not revealed future event}, x \text{ fixed future event}) \vee (x \text{ revealed future event}, x \text{ not fixed future event})\}$

$\Rightarrow \forall x: x \text{ not revealed future event}, x \text{ fixed future event} \vee x \text{ revealed future event}, x \text{ not fixed future event} \Rightarrow$

$\forall x: x \text{ fixed future event } \vee x \text{ not fixed future event} \Rightarrow \forall F: F \text{ fixed } \vee F \text{ not fixed} \Rightarrow$

$\exists! S: S \text{ continuos } \vee S \text{ discontinuos}$

4)=> 5)

$\exists! S: S \text{ continuos} \vee S \text{ discontinuos} \Rightarrow \forall F: F \text{ fixed} \vee F \text{ not fixed} \Rightarrow$

$\forall F: F \text{ not revealed} \vee F \text{ revealed} \Rightarrow \exists! S: S \text{ darked} \vee S \text{ illuminated}$

5)=> 6)

$\exists! S: S \text{ darked} \vee S \text{ illuminated} \Rightarrow \forall F: F \text{ not revealed} \vee F \text{ revealed} \Rightarrow$

$\forall F: F \text{ fixed} \vee F \text{ not fixed} \Rightarrow \forall x: x \text{ fixed future event} \vee x \text{ not fixed future event} \Rightarrow$

$\forall x: x \text{ fixed future event} \vee \forall x: x \text{ not fixed future event} \Rightarrow$

$S = \{x: x \text{ fixed future event}\} \vee S = \{x: x \text{ not fixed future event}\} =$
 $> S \text{ is Einstein's} \vee S \text{ is Heinsberg's}$

6)=> 7)

$S \text{ is Einstein's} \vee S \text{ is Heinsberg's} \Rightarrow S = \{x: x \text{ not revealed future event}\} \vee S$
 $= \{x: x \text{ revealed future event}\} \Rightarrow$

$\forall x: x \text{ not revealed future event} \vee \forall x: x \text{ revealed future event} =$
 $> \forall F: F \text{ not revealed} \vee F \text{ revealed}$

7)=> 8)

$\forall F: F \text{ not revealed} \vee F \text{ revealed} \Rightarrow \forall F: F \text{ fixed} \vee F \text{ not fixed}$

8)=> 9)

$\forall F: F \text{ fixed} \vee F \text{ not fixed} \Rightarrow \forall F: \exists F \vee \nexists F$

9)=> 10)

$\forall F: \exists F \vee \nexists F \Rightarrow \forall F: F \text{ fixed} \vee F \text{ not fixed} \Rightarrow$

The law of big number is fake $\vee$ *The law of big numbers is true*

10)=> 1)

The law of big number is fake $\vee$ *The law of big numbers is true* $\Rightarrow$

$\forall F: F \text{ fixed} \vee F \text{ not fixed} \Rightarrow \exists! S: S \text{ is Einstein's} \vee S \text{ is Heinsberg's} \Rightarrow$

$\exists! S: S \text{ is Velleca's}$

Eleventh Velleca's Theorem

Let S space-time. Then:

1) S is Einstein's $\Rightarrow S$ is Velleca's

2) S is Heinsberg's $\Rightarrow S$ is Velleca's

Dem.

S is Einstein's $\Rightarrow S$ darked $\Rightarrow S$ is Velleca's

S is Heinsberg's $\Rightarrow S$ illuminated $\Rightarrow S$ is Velleca's

Twelveth Velleca's Theorem

Let S_E Einstein's space – time and S_H Heinsberg's space – time. Then:

$$S_E \cap S_H = \emptyset$$

Dem.

$$S_E \cap S_H = \{x: x \text{ fixed future event}\} \cap \{x: x \text{ not fixed future event}\} = \{x: x \text{ fixed future event}, x \text{ not fixed future event}\} = \emptyset$$

Thirteenth Velleca's Theorem

Let S_E Einstein's space – time and S_H Heinsberg's space – time. Then:

$$S_E \cup S_H = S_E \parallel S_H$$

Dem.

$$S_E \parallel S_H = (S_E \cup S_H) \setminus (S_E \cap S_H) = (S_E \cup S_H) \setminus \emptyset = S_E \cup S_H$$

Fourteenth Velleca's Theorem

Let S space-time, Then:

S is Velleca's $\Leftrightarrow S$ is a partition

Dem.

S is Velleca's $\Leftrightarrow S = S_E \cup S_H, S_E \cap S_H = \emptyset, S_E \neq \emptyset, S_H \neq \emptyset \Leftrightarrow S$ is a partition

Fifteenth Velleca's Theorem

Let S space-time, Then:

S is Velleca's $\Leftrightarrow S_E \subseteq S$ or $S_H \subseteq S$

Dem.

$\Rightarrow$

S is Velleca's $\Rightarrow S = S_E \cup S_H \Rightarrow S_E \cup S_H \subseteq S \Rightarrow S_E \subseteq S$ or $S_H \subseteq S$

$\Leftarrow$

$S_E \subseteq S$ or $S_H \subseteq S \Rightarrow S_E \cup S_H = S \Rightarrow S$ is Velleca's