

- SERGEY DROBYSHEVICH, SERGEI ODINTSOV, *Towards a classification of algebraizable FDE-based modal logics*.

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In [3] a first attempt to compare different known FDE-based modal logics was made; this work motivated a classification of FDE-based modal logics developed in [1, 2]. The main ideas behind this classification were (i) that every modal operator  $\circ$  over FDE can be analysed in terms of two modal behaviours — one corresponding to asserting  $\circ\varphi$  and one corresponding to rejecting  $\circ\varphi$  and (ii) that one can study these two behaviours independently from each other in a modular way. Accordingly, four basic *partially-defined* modalities were introduced:  $\forall^+$  ( $\exists^-$ ) and  $\exists^+$  ( $\forall^-$ ) correspond to asserting and rejecting  $\Box\varphi$  ( $\Diamond\varphi$ ) over FDE, respectively. They are partially-defined insofar only one of two behaviours is explicitly defined for them.

In this work we investigate algebraic semantics for these basic modalities. As it turns out, the minimal systems are not algebraizable and we are forced to extend them slightly. This way we obtain four systems closed under rules:

$$\frac{\varphi \Vdash \psi}{\circ\varphi \Vdash \circ\psi}, \quad \frac{\sim\varphi \Vdash \sim\psi}{\sim\circ\varphi \Vdash \sim\circ\psi}.$$

We show that they are indeed algebraizable and investigate their equivalent algebraic semantics. We also consider relational semantics for these systems, which involve frames with one accessibility relation and one neighbourhood function to model each modality.

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[1] SERGEY DROBYSHEVICH, *Sorting our FDE-based modal logics*, **AiML2018: Accepted Short Papers**, pp. 36–40.

[2] SERGEY DROBYSHEVICH, *A general framework for FDE-based modal logics*, **Studia Logica**, submitted.

[3] SERGEI ODINTSOV AND HEINRICH WANSING, *Disentangling FDE-based paraconsistent modal logics*, **Studia Logica**, vol. 105 (2017), no. 6, pp. 1221–1254.