

# WF-holonomicity of constructible distributions on non-archimedean local fields

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# The Archimedean case

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“All the distributions which appear in nature are holonomic”

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- No action of differential operators on distributions

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☹ WF-holonomicity is not stable under Fourier transform

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# (p-adic) Wavelet transform

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It is easy to see that WL is 1-1.

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## Theorem (Cluckers-Halupczok-Loeser-Raibaut, 2018)

- *The class of constructible distributions is closed under the above operation, whenever defined.*
- *Constructible distributions are smooth almost everywhere.*

# Main Result

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- *Regularization*: a constructible distribution can be extended from an open set
- *Resolution of singularities in the constructible (in fact, definable) setting.*
- *Key-Lemma*: a smooth constructible function on an open set can be extended to an holonomic constructible distribution.

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- By the induction assumption  $p_*(\mu) - \eta$  is WF-holonomic.

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## Key Lemma

*Let  $f$  be a constructible function on an open (definable) set  $U \subset V$ . Then  $f$  can be extended to a constructible WF-holonomic distribution on  $V$ .*

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- Instead we can swallow it in  $m_1$

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- ☹ while  $u_2$  and  $u_3$  can be ignored,  $u_1$  cannot.
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- Now we prove the Key lemma for the compliment of the origin.

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