AfkQed & Co.

RMCL2 workshop

SNS, Pisa, 08/05/25

L. Cotrozzi

on behalf of «AfkQed team»

RMCL2 future logo

STRONG 2020

UNIVERSITY OF LIVERPOOL

LEVERHULME TRUST

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What is AfkQed?

- See 2024 presentations at the MITP Topical Workshop and at the Satellite Workshop in Liverpool
- RMCL2 WG paper: →

[276]: Czyż and Kühn

[278]: **A**rbuzov, **F**edotovich, **K**uraev et al → **Afk**Qed

		$e^+e^- \to \mu^+\mu^-\gamma$	$e^+e^- \to \pi^+\pi^-\gamma$
ISC	LO	Exact matrix elements [278]	EVA [276]
	NLO	Collinear structures [93, 129]	
FSC	LO	Exact matrix elements [278] including ISR-FSR interference	No FSR at LO
	NLO	PHOTOS [279]	
HVP		None, leptonic only [278], leptonic [278] + hadronic, or NSK VP [168, 169]	FxsQED

- Developed mostly by V. Druzhinin starting from EVA code

Plans for the future

- No plans to develop the code, except to adapt it to RMCL2 needs
- Still important to look at it for comparisons, even if it won't change
- AfkQed is based on 2nd version of EVA code. 1st version of EVA:
  - Can be found here
  - Did not have 4π, but for 2π ($e^+e^- \to \pi^+\pi^-\gamma$) it had ISR + FSR + interference **at leading order** (as opposed to AfkQed)
  - Collinear structure function to simulate higher order ISR beyond Born level contribution
- Maybe EVA-1st version could be the «8th code» in Phase II? Plans to get the ball rolling. Thanks to Achim and Olga for input so far.