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Analyzing Flare Ribbons to Determine Magnetic Reconnection Flux and its Relationship to Flux Rope Formation[1] JADA MAXWELL, The Evergreen State College, JIONG QIU, RICHARD CANFIELD, Montana State University — Is the helical structure of a magnetic cloud (MC) largely pre-existing before its eruption or formed in situ by magnetic reconnection in the solar corona during the eruption? The flux of magnetic reconnection in the low solar corona can be evaluated through the flare ribbons observed in the chromosphere. Using data from TRACE and SOHO MDI, we measure the total magnetic reconnection flux swept up by flare ribbons in events associated with coronal mass ejections (CME). We compare this to MC flux measured in situ at 1 AU and find a near linear scaling pattern between MC poloidal flux and total reconnection flux. This relationship suggests that low corona reconnection is highly relevant to flux rope flux for the samples in our study. We note that this relationship does not distinguish events with or without filament eruption. Therefore, filaments may not play a role of carrying a significant amount of pre-existing flux.

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