Where do auroral arcs generate?

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There are several tens of theories for auroral arc formation [see, e.g., the review of Borovsky, *JGR*, *98*, 6101-6138, 1993]. In about half of them the source of auroral arcs is supposed to be in the ionosphere [e.g. Sato and Holzer, *JGR*, *78*, 7314-7329, 1973]. In others it is inferred that the arcs originate from the magnetosphere [e.g. Lyons, *JGR*, *86*, 1-8, 1981]. In order to distinguish between these two mechanisms, we have examined the irregular Poynting flux component on the scales of 10-100 km in the high-latitude ionosphere, meaning that the irregularities considered can be identified with the auroral arcs. The electric and magnetic measurements of the Dynamic Explorer-2 satellite (altitudes from 300 to 1000 km) for one and half year period were used. We obtained that more than 90% of the disturbed Poynting flux is downward, i.e. the electromagnetic energy flows into the ionosphere, implying the energy source of auroral arcs being located in the magnetosphere.