

# 中国密集植被山区三维层析 SAR 成像研究

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3D SAR 层析成像 (TomoSAR) [1-4]和 4D SAR 差分层析成像 (Diff-TomoSAR) [8-14]利用多基线 SAR 来创建 SAR 干涉测量数据集, 在相同的 SAR 像素中基于多基线后向散射感测复杂场景。除了复杂的城市/基础设施领域的三维特征重建和形变监测[2,4], 以及最近的冰冻圈冰调查应用外[5], 新兴的层析 SAR 应用扩展到森林场景[3,6,7], 例如树木高度和生物量估计, 森林子表地形图, 甚至树丛下目标探测, 搜索, 救援和监视。然而, 这些场景存在轨道, 对流层和电离层相位变形, 时间去相关等问题, 特别是在树木密集的山区地区可能的高度模糊和精度损失等问题。因此, 3D SAR 层析成像和 4D SAR 差分层析成像急需解决时间去相关, 轨道, 对流层和电离层相位畸变等问题。

在此论文中, 我们将讨论在密集植被的四川省都江堰山区使用 X 波段 COSMO-SkyMed Spotlight 和 L 波段 ALOS-1 PALSAR 数据集进行 3-D SAR 层析成像。新的 TanDEM-X 12m DEM 将用来帮助所有数据集进行配准; 然后使用诸如 ERA-I, GACOS 等模型来评估校正大气影响以消除对流延迟; 同时讨论电离层校正方法以消除电离层延迟; 最终获得每个像素内的散射体情况, 每个散射体的散射振幅和相位, 层析成像图, 以及它们的 3D 位置和运动参数变形等。我们将汇报研究的最新进展。

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