

# Contents

<b>1</b>	<b>Introduction</b> .....	1
<b>2</b>	<b>Preliminaries</b> .....	9
2.1	Group Theory Preliminaries .....	9
2.2	Rank 1 Groups of Lie Type .....	14
2.3	Recognition Results .....	19
<b>3</b>	<b>Fusion Systems</b> .....	35
3.1	Fusion Systems .....	35
3.2	Essential Subgroups .....	40
<b>4</b>	<b>Amalgams in Fusion Systems</b> .....	45
4.1	Group Amalgams .....	45
4.2	Amalgams in Fusion Systems .....	49
4.3	The Main Results .....	52
<b>5</b>	<b>The Amalgam Method</b> .....	57
5.1	The Amalgam Method .....	57
5.2	Strongly $p$ -Embedded Subgroups in the Amalgam Method .....	62
5.3	The “Pushing Up” Case .....	67
5.4	Subamalgams and More Pushing Up Arguments .....	72
<b>6</b>	$Z_{\alpha'} \not\leq Q_{\alpha}$ .....	85
6.1	$Z_{\beta} \neq \Omega(Z(S))$ .....	86
6.2	$Z_{\beta} = \Omega(Z(S))$ .....	90
<b>7</b>	$Z_{\alpha'} \leq Q_{\alpha}$ .....	107
7.1	$C_{V_{\beta}}(V_{\alpha'}) < V_{\beta} \cap Q_{\alpha'}$ .....	115
7.2	$C_{V_{\beta}}(V_{\alpha'}) = V_{\beta} \cap Q_{\alpha'}$ .....	140
7.3	$b = 1$ .....	184
	<b>Appendix A</b> .....	199
	<b>References</b> .....	201